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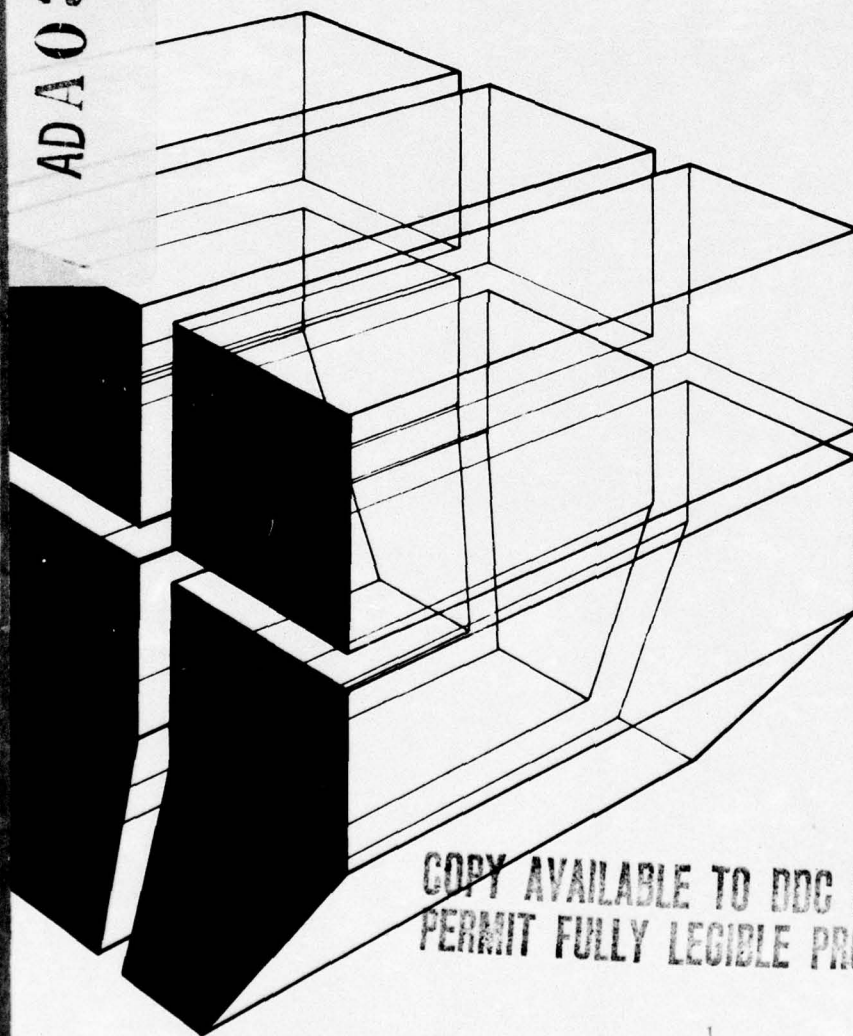
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September 1976

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A PROPOSED HIERARCHICAL STRUCTURE
OF FUNCTIONAL SPACES FOR BUILDINGS



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structure and descriptors is introduced with an explanation of its use. Recommendations for future work, including the structure, contents, and eventual computerization are presented in the conclusion.

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FOREWORD

This study was conducted for the Directorate of Military Construction, Office of the Chief of Engineers (OCE), under Project 4A762719AT05, "Initial Investigation of Military Construction Technology"; Task 02, "Engineering Design Criteria and Technology for Military Facilities"; Work Unit 002, "Systems Approach to Design Criteria Format Development." The work was performed under Contract No. DACA 88-74-C-0024 by the Engineer's Collaborative Ltd., in association with Harry Weese and Associates, Ltd.

Mr. William Cochran was the OCE Technical Monitor.

This work was performed by the Management Systems Branch (FAM) Facility Acquisition and Construction Division (FA), U.S. Army Construction Engineering Research Laboratory (CERL), Champaign, Illinois. The project investigator was Mr. Michael J. O'Connor and the associate investigator was Mr. D. A. Jordani. Dr. O. Rood, Jr. is Chief of FAM. Mr. E. Lotz is Chief of FA.

COL J. E. Hays is Commander and Director of CERL, and Dr. L. R. Shaffer is Deputy Director.

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A PROPOSED HIERARCHICAL STRUCTURE OF FUNCTIONAL SPACES FOR BUILDINGS

1 INTRODUCTION

Background

This report proposes a structure within which to organize facility design criteria for quick and easy reference and retrieval.

The Corps of Engineers has a large volume of data and design criteria that addresses many of the aspects of a facility's functional space at various levels. This information is continuously in demand for use in the Corps' many construction projects.

It is necessary for both Corps personnel and their outside A/E contractors to be able to more readily and completely access this large body of information, so that they in turn can assure a timely, appropriate and complete response to the need for Department of Defense facilities. Installation and Corps personnel need quick and ready access to this data--first as an aid to programming a facility and later to facilitate their review of the design and working drawings. A/E contractors need quick and ready access to all the data pertinent to their project in order to develop a responsive design and produce complete and coordinated contract documents.

A review of facility types presently programmed for the next several fiscal years indicates a prevalence of the following five facility types:

1. Administrative office facilities
2. Bachelor housing
3. Classroom training facilities
4. Research and development laboratories
5. Shop maintenance facilities

Data pertaining to these facility types will be in the greatest immediate demand.

Purpose

The purpose of this report is to devise a means for providing quick and easy access to the body of information commonly referred to as "design data," and solve design problems of current projects.

Approach

In response to the problems and objectives stated above the Construction Engineering Research Laboratory (CERL) has determined that the most appropriate course of action is:

1. To provide an organizational structure for the body of information commonly referred to as "design criteria."
2. To apply this structure to the five most prevalent facility types to be constructed over the next several fiscal years.

To accomplish this, CERL has contracted with TEC, in association with Harry Weese and Associates, to develop a Hierarchical Structure of Functional Spaces for specific use with the following facility types:

1. Administrative Office Facilities
2. Bachelor Housing
3. Classroom Training Facilities
4. Research and Development Laboratories
5. Shop Maintenance Facilities

TEC, with Harry Weese and Associates, in turn has developed a six-step strategy in response to the above.

1. Identify, collect, and analyze sources of hierarchical theory.
2. Explore and develop concepts of hierarchical structure.
3. Identify, collect, and analyze descriptor sources.
4. Select and apply descriptors to the proposed structure.
5. Review, test, and modify the structure and applied descriptors.
6. Propose a hierarchical structure with descriptors applied to each of the five building types.

This report is a result of this strategy, and is the culmination of the sixth step.

2 STRUCTURE

It is proposed that a five-level hierarchical structure be used to organize the Corps' facility design criteria. In addition, it is proposed that one (or more) levels be developed above this hierarchy in which to organize information pertaining to each of the facility types. Each of these levels is seen as having distinct functional space characteristics that relate to the other levels in some order of rank, grade, class, etc. The entire structure, therefore, is based on functional space differences and consists of six distinct levels which range in logical steps from the broad scope first level Facility Type category to the sixth and lowest level Activity Space category.

The Basic Hierarchy

The various levels of the hierarchy were assigned names for ease of working reference as the structure was developed. They are presented here with the thought that they will prove helpful in understanding the structure. It is believed that they will be helpful in its final use. The following levels, numbers, and names are used throughout this report:

1. Level I Facility Type
2. Level II Spatial Type
3. Level III Functional Type
4. Level IV Functional Group
5. Level V Functional Space
6. Level VI Activity Space

Level I--Facility Type

This first level of the structure, which has been termed "Facility Type" is seen as categorizing facilities by their major functional and spatial differences, e.g., Administrative Office Facilities are seen as being significantly different in both functional and spatial requirements from Shop Maintenance Facilities and are therefore considered as a distinct category.

This level of structure relates readily to what is often referred to as "Building Type" but is intended to go beyond that concept to include other aspects of a project than just the building. Both programmers and designers commonly focus in on projects from this initial

stand. It also sets a valuable context in which to review the preliminary project designs.

It is proposed that two types of information or criteria be located under each Level I Facility Type. First, that which is pertinent to all such facilities in that category, and second, that which is pertinent solely to that facility at hand. In both cases, the information would pertain to the facility in general. It would include:

1. Facility Type philosophy and policy
2. Intended use of the specific facility
3. Relationship of the facility to its surroundings.

An example of such contents is found in the Appendix.

Level II--Spatial Type

The second level of the structure divides each Facility Type into two broad categories of facility spaces--interior and exterior (definitions of these categories will be addressed later).

This provides a natural division of current information and criteria. It also relates well to normal project programming procedures which distinguish between site and building requirements, and is compatible with most design procedures.

Information and criteria envisioned as being located under these Level II descriptors will be either pertinent to all such spaces in the category or pertinent solely to the facility space category at hand, and include:

1. Spatial type philosophy and policy, e.g., two- or three-story building with a maximum of 10,000 sq ft; or criteria for height to width and length ratio; or area criteria.
2. General description of the type of enclosed or open functions; e.g., the facility will include separate structures for repair shop, inspection, and point storage; or incorporate provisions for a new sanitary lift station, parking lot, and two new tennis courts.

Level III--Functional Type

The third level of the proposed structure divides each of the Level II Spatial Types into categories having to do with broad functions, e.g., a category of spaces serving a support/services function. It is expected that the following type of information and criteria would be located under these Level III Functional Type categories:

1. Information as to who the users are and a general description of their functions and relationships.
2. Quantities of user groups.
3. Information that distinguishes between categories.
4. Basic Functional Type philosophy.

Thus, this level provides the next logical step in degree of detail used by both the project programmer and designer. We anticipate that there is a relatively small body of existing written information or criteria for this level. If so, it is likely due to the fact that much of such information is provided verbally in the form of clarifications and explanations.

Level IV--Functional Group

The fourth level of the structure, which has been termed "Functional Group," divides each of the Level III Functional Types into categories of spaces distinguished by the similarity of functions or activities which occur in each space. For example, one such category on this level is "Residence." Under this category are grouped the numerous living spaces associated with Housing (see Appendix). This is opposed to office type spaces, which have been grouped under the "Administrative" category.

The type of information proposed to be listed under a Level IV descriptor includes the following:

1. The basic intent and philosophy of the Functional Group.
2. Specific criteria that pertains to all the spaces within that Functional Group, e.g., criteria stating that all ceiling heights in administrative offices shall be 10 ft, or lighting levels shall be 100 footcandles.
3. Relationships between Functional Groups, e.g., criteria that would separate the administrative (office spaces) in a training facility from the actual training rooms or classrooms within a facility, or conversely, integration requirements stating the need for combining administrative type spaces with research type spaces in a particular facility.

This level of the structure performs two important functions. First, it provides a natural location for a body of information and criteria which is too often unrecorded and passed on (as above) verbally in the form of clarifications and explanations. This is primarily true of the first and third types of information.

The second function is to provide a natural level for a large body of existing information and criteria that deals with broad categories of spaces.

This Level IV Functional Group should prove a valuable source for schematic design review by the Corps and Installation, while providing the A/E designer with an important set of information normally requested or generated when not provided. It should also prove valuable to the programmer of a more unique type of project by providing a natural grouping of all similarly functioning spaces, e.g., a grouping of all "Administrative" space types on the levels below.

Level V--Functional Spaces

The "Functional Spaces" of Level V of the proposed structure act as the next natural subset of the hierarchy. This level of the structure is intended to categorize information pertinent to the room level of functions and spaces. Criteria and data expected to be found under this set of descriptors may prove to be the most extensive of any of the levels. It is likely to include:

1. Precise area, occupancy, and functional criteria.
2. Environmental criteria such as temperature, humidity, and light.
3. Adjacency criteria.
4. Safety and convenience criteria.
5. Service and utility criteria.

All programming efforts known to the authors that deal with categorizing information for functional spaces use some form of the "Functional Space" level. A/E's commonly use such categories in design and it will undoubtedly be of use to the reviewer as a result.

Level VI--Activity Spaces

This sixth and lowest level of the proposed structure provides a level for categorizing information that deals with functions and spaces at the sub-room level.

This proposed lowest level of the hierarchical structure is seen as providing considerable flexibility to the structure, as well as keeping the Level V categories within manageable quantities. These Level VI categories have been called "Activity Spaces." They deal with spaces within Functional Space where distinct, discernible activity takes place, e.g., Student Seating Area, or Teaching Station within a

classroom. Without them it might be necessary to separately classify each of a group of classrooms as a unique Functional Space. The use of Level VI Activity Space categories are intended to be used to define the unique Activity Spaces of each otherwise duplicate Functional Space, thereby permitting the several Functional Spaces to be described as one, e.g., two "Briefing Rooms" differ only in the requirement that one also provides a lecture platform at one end for assembly functions; use of a Level VI, Activity Space category in the hierarchy will permit a single Level V descriptor, "Briefing Rooms."

It is anticipated that the following type data will be stored on this level:

1. Activity criteria
2. Unique furniture and service utility criteria.

Flexibility

The proposed structure described above has been developed to relate well to programmer, designer, and reviewer while accommodating existing sources of data. It is constructed to work with normal professional design procedures as well as with logical program development. The broad scope to narrow scope structure is intended to permit the A/E first receiving data to absorb it in a logical way. Later, it is structured to allow him to move successively through or to selectively skip portions of the data, depending on his need.

The programmer's development of the project program from information on DA Form 1391, supplemented by AR and DOD Design Criteria, and refined by pertinent TM and installation criteria has been considered in the development. It is believed that the same logical structure will serve the reviewer well, as he proceeds through the several review phases for his individual project.

The horizontal organization of the structure, the number of categories, and their identity is intended to expand or contract depending on the Facility Type. In this way, new or modified Facility Types may be added or obsolete ones readily removed. This is also intended to allow for easy update on all levels of the structure.

3 DESCRIPTORS

Each of the categories worked with on the various levels of the structure described above has also been assigned a name or "descriptor." This descriptor serves to identify the contents of the category to which it is assigned, much as the titles of the six levels describe the contents of the level.

Origins

The origins of the descriptors generated for this report are diverse. Where possible, military terminology has been used, but where other terminology was felt to be more appropriate or terminology did not exist, other sources were collected and included.

Level I (Facility Type) descriptors were taken directly from the pre-established scope of this report. They relate quite closely to the Department of the Army Facility Classes and Construction Categories contained in AR 415-28.

Level II (Spatial Type) descriptors reflect the initial subject areas sought in this report. They also have a strong basis in civilian and military terminology.

Level III (Functional Type) descriptors were generated internally and relate to previous programming work and to a lesser extent to civilian design terminology.

The descriptors generated for Level IV (Functional Group) resulted from internal analysis of potential functional space groupings. Most of these descriptors relate to common design terminology.

Department of Defense, Army, and Corps documents and drawings were the primary source of Level V (Functional Space) and some Level VI (Activity Space) descriptors. Where these were insufficient, civilian publications, drawings, and facility programs were used. Many of the Level V and VI descriptors dealing with the "Exterior" segment of the structure were generated internally, as no existing sources were found.

Terminology varied considerably from source to source, and in many cases it was necessary to establish a single generic descriptor from many pages of terms, e.g., many pages of names relating to offices were finally reduced to less than a dozen descriptors. The key criterion used to decide if a term was suitable for a descriptor was its capability to define a unique set of requirements that would be contained under that descriptor.

Level I--Facility Type

Due to the scope of the project, the Level I "Facility Type" descriptors have been limited to the following:

1. Administrative office facilities
2. Bachelor housing
3. Classroom/training facilities
4. Research development and training laboratories
5. Shop maintenance facilities

It is envisioned that this level can readily be expanded for future use by including the appropriate facility type descriptor, e.g., Hospital Facilities, Family Housing, or Community Facilities.

It is the authors' opinion that the descriptors finally used for this level should represent a narrowly defined, commonly constructed building category. (See Conclusions and Recommendations.)

Level II--Spatial Type

The proposed second-level descriptors define the two Spatial Types:

1. Interior
2. Exterior

It is intended that the descriptor "Interior" will encompass those spaces physically enclosed on at least five of the six theoretical sides of a space. Hence a storage type structure with floor, roof, and three enclosed sides (one side open) would be described as "Interior," whereas a structure covering a walkway and open on its remaining sides would be described as "Exterior."

It should not be necessary to revise the descriptors on this level in order to accommodate either future Facility Type additions or changes to the levels below.

Level III--Functional Type

The proposed third-level descriptors are:

1. Primary
2. Support/Services

These define the two Functional Types of Space.

The "Primary" functional type includes those spaces which are unique to groups of occupants performing the functions for which the facility is intended.

The "Support/Services" functional type includes those spaces which:

1. Are common to all occupants.
2. Provide support functions for the facility.
3. Provide service functions for the facility and occupants.

It should be noted that in using these definitions, maintenance space in a maintenance facility would be considered a "Primary" function, while in an administrative facility it would be considered a "Support/Service" function. Similarly, storage spaces used by the occupants of primary function rooms are considered as "Primary" spaces, whereas building type storage spaces fall under the "Support/Service" category.

These two descriptors are utilized under each of the Level II Spatial Types--Interior and Exterior. This, in effect, creates four Functional Types:

1. Interior Space/Primary Functional Type
2. Exterior Space/Primary Functional Type
3. Interior Space/Support/Services Functional Type
4. Exterior Space/Support/Service Functional Type

These third-level descriptors should be able to be repeated for any future "Facility Type" and their generality should allow changes at the lower levels to be accommodated without revision.

Level IV--Functional Group

On Level IV, the following descriptors, which occur under the four types of Level III Functional Spaces, are proposed. Under the first type, "Interior Space/Primary Functional Type":

1. Administrative
2. Assembly
3. Maintenance

4. Production
5. Research
6. Residence
7. Social/Recreation
8. Training

Under the second type, "Exterior Space/Primary Functional Type":

1. Ceremonial
2. Landscape
3. Maintenance
4. Research
5. Social/Recreation
6. Training

It will be noted that several of the second set of descriptors are repeats of descriptors in the first set, e.g., "Maintenance." In the first instance, the descriptor can be read as "Interior Space/Primary Functional Type/Maintenance Functional Group" or, in more manageable words, "Interior Maintenance." In the second instance, the descriptor can be read "Exterior Maintenance" (Exterior Space/Primary Functional Type/Maintenance Functional Group).

The proposed descriptors which occur under the third and fourth types of Level III Functional Spaces also use repetitious descriptors and should be read as indicated above. Under the third and fourth types, "Interior Space/Support/Service Functional Type," and "Exterior Space/Support/Services Functional Type," the following are proposed:

1. Access Areas
2. Service Areas
3. Utility Areas

These Level IV Functional Group descriptors identify categories composed of a set of spaces in which a distinct type of function occurs, i.e., the descriptor "Maintenance" was generated to categorize information and criteria that relate to a set of spaces in which the maintenance function is dominant.

Level V--Functional Space

Functional Space descriptors form the bulk of items in the hierarchical structure proposed. They will primarily be composed of what are commonly understood to be room names, where they occur as in "Interior" space function, e.g., "Classroom" or "Laboratory." Where these descriptor categories occur within the "Exterior" Portion of the structure, the descriptors do not all have the benefit of a close association with a commonly defined space such as a room. In these instances, an attempt has been made to maintain the same space and function reference that naturally occurs in most rooms, e.g., Gas Distribution Space, Vehicle Circulation Space, or Electrical Equipment Area.

Figure 1 illustrates Functional Space categories contained under the "Exterior" segment of the structure and has been developed to better illustrate the nature of descriptors selected and used in this report. It has been found that there is a strong tendency for people to think in terms of hardware and equipment when dealing with these areas, rather than in terms of function and space categories, which are meant to contain information and criteria.

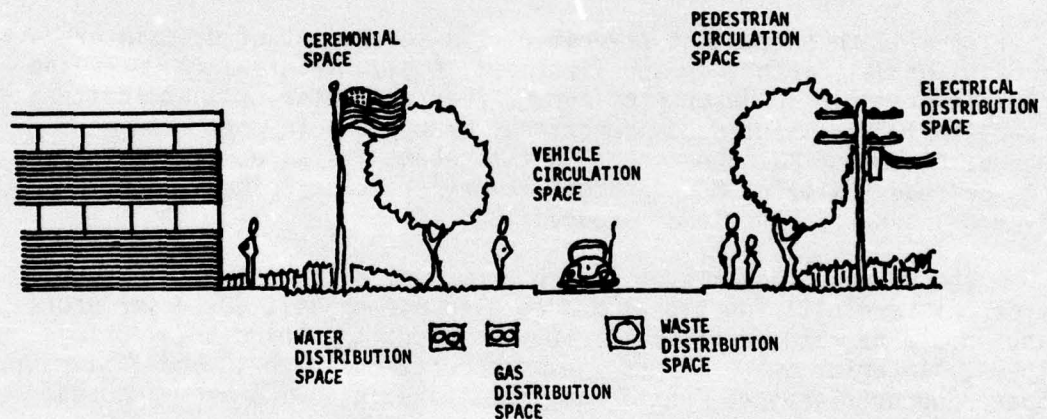


Figure 1. Functional space categories.

When adding descriptors or modifying those presented here it is recommended that descriptors be developed with these factors and criteria in mind.

It is likely that some of the Level V descriptors presented here will be modified when information and criteria are entered under these categories. Their basis is the functional information and criteria which they contain and as this content is gathered, it may demonstrate the need for two descriptors where one was proposed or vice versa, e.g.,

the Physical Chemistry Electron Microscope Room category may be found to have no real significant difference in information and criteria content than the Metallurgy Lab Microscope Room.

Level VI--Activity Space

The proposed Activity Space descriptors are composed of terms identifying key subroom level spatial activity categories (to repeat a previous example, "Student Seating Area" or "Teaching Station" within a classroom). The descriptors of this level have all of the characteristics of the Level V descriptors except for size (they are a subset of the room type space).

Descriptors in the "Exterior" portions of the structure have been generated with the same effort to maintain space and activity functions parallel to those descriptors in the "Interior" portion of the structure. Their eventual modification is also predicted on the same basis as the fifth level.

Reference System

A reference system has been developed to identify each of the descriptors (used in the hierarchical structure). The system consists of a two-segment number. The first segment identifies the level on which the descriptor occurs; i.e., if the descriptor is a Level III, Functional Type Descriptor, the first number is three).

The second segment is a number which is uniquely assigned to each descriptor in a given level. The descriptors are sequentially numbered within each level starting at .010 for Levels I through IV, and .001 for Levels V and VI. Levels I through IV progress at an interval of .01, while Levels V and VI progress on an interval of .001.

Descriptor File

The following pages present the final list of descriptors developed for this report. It will be noted that some descriptors have been repeated. This occurs whenever the information or criteria that will be continued under each descriptor category will be significantly different in spite of the duplication of terms. For example, there are two Level VI descriptor categories identified as "Toilet Area" (number 6.186 and 6.187); one descriptor category will contain information and criteria which pertain to a public toilet area, while the other will contain information and criteria which pertain to a residence space. It should be noted that this becomes quite obvious when these descriptors are seen in the context of the structure and will become even more so when their contents are included.

Descriptor File--Levels I through IV

Table 1 is a list of all descriptors from Level I through IV, preceded by their assigned reference numbers.

Descriptor File--Level V

Table 2 is a list of all descriptors from Level V preceded by their assigned reference numbers.

Descriptor File--Level VI

Table 3 is a list of all descriptors from Level VI, preceded by their assigned reference numbers.

Table 1

Level I through IV Descriptor File

| GENERAL HIERARCHICAL STRUCTURE | | | LISTED 08-22-74 | PAGE 1 |
|----------------------------------|--------------------|--|-----------------|--------|
| LISTING OF SORTED LEVEL I FILE | | | | |
| CERL NO. | DESCRIPTOR | | | |
| 1.010 | ADMIN OFFICE FACIL | | | |
| 1.020 | BACHELOR HOUSING | | | |
| 1.030 | CLASSRM THNG FACIL | | | |
| 1.040 | ROST LABORATORY | | | |
| 1.050 | SHOP MAINT FACIL | | | |
| LISTING OF SORTED LEVEL II FILE | | | | |
| CERL NO. | DESCRIPTOR | | | |
| 2.010 | EXTERIOR | | | |
| 2.020 | INTERIOR | | | |
| LISTING OF SORTED LEVEL III FILE | | | | |
| CERL NO. | DESCRIPTOR | | | |
| 3.010 | PRIMARY | | | |
| 3.020 | SUPPORT/SERVICES | | | |
| LISTING OF SORTED LEVEL IV FILE | | | | |
| CERL NO. | DESCRIPTOR | | | |
| 4.010 | ACCESS AREAS | | | |
| 4.020 | ADMINISTRATIVE | | | |
| 4.030 | ASSEMBLY | | | |
| 4.040 | CEREMONIAL | | | |
| 4.050 | LANDSCAPE AREAS | | | |
| 4.060 | MAINTENANCE | | | |
| 4.070 | PRODUCTION | | | |
| 4.080 | RESEARCH | | | |
| 4.090 | RESIDENCE | | | |
| 4.100 | SERVICE AREAS | | | |
| 4.110 | SOCIAL/RECREATION | | | |
| 4.120 | STORAGE | | | |
| 4.130 | TRAINING | | | |
| 4.140 | UTILITY AREAS | | | |

Table 2
Level V Descriptor File

| C.E.R.L. HIERARCHICAL STRUCTURE | | | LISTED 06-22-74 | PAGE 1 |
|---------------------------------|------------------------------------|--|-----------------|--------|
| LISTING OF SORTED LEVEL V FILE | | | | |
| CERL NO. | DESCRIPTION | | | |
| 5.001 | APPARATUS ROOM | | | |
| 5.002 | AUDITORIUM | | | |
| 5.003 | BALANCE ROOM | | | |
| 5.004 | BARRIER/SCREEN | | | |
| 5.005 | BEDROOM | | | |
| 5.006 | BREAK AREA | | | |
| 5.007 | BRIEFING | | | |
| 5.008 | BRIEFING | | | |
| 5.009 | BUILDING SEPARATION | | | |
| 5.010 | CEILING CAVITY | | | |
| 5.011 | CENTRAL BATHROOM | | | |
| 5.012 | CENTRAL FILE | | | |
| 5.013 | CENTRIFUGE ROOM | | | |
| 5.014 | CHEMISTRY, CONSTANT TEMP. ROOM | | | |
| 5.015 | CHEMISTRY, ELECTRON MICROSCOPE LAB | | | |
| 5.016 | CHEMISTRY, GENERAL LAB | | | |
| 5.017 | CLASSIFIED READING ROOM | | | |
| 5.018 | CLASSROOM TESTING | | | |
| 5.019 | CLASSROOM, INSTR. LAB. | | | |
| 5.020 | CLASSROOM, LECTURE | | | |
| 5.021 | CLASSROOM, LECTURE/LABORATORY | | | |
| 5.022 | CLASSROOM, READING LAB. | | | |
| 5.023 | CLOSET, EYE EQUIP. | | | |
| 5.024 | CLOSET, HVAC EQUIP. | | | |
| 5.025 | CLOSET, JANITORS | | | |
| 5.026 | CLOSET, PLUMBING EQUIP. | | | |
| 5.027 | COMPUTER ROOM | | | |
| 5.028 | CONFERENCE | | | |
| 5.029 | CONFERENCE (PRIVATE) | | | |
| 5.030 | CORRIDOR | | | |
| 5.031 | COURT YARD | | | |
| 5.032 | CRAWL SPACE/UTILITY TUNNEL | | | |
| 5.033 | DARK ROOM | | | |
| 5.034 | DARK ROOM, LABORATORY | | | |
| 5.035 | DEFUSING AREA | | | |
| 5.036 | DISPOSAL, STORM WATER | | | |
| 5.037 | DISPOSAL, WASTE | | | |
| 5.038 | DISTRIBUTION SPACE, E/E | | | |
| 5.039 | DISTRIBUTION SPACE, GAS | | | |
| 5.040 | DISTRIBUTION SPACE, STORM WATER | | | |
| 5.041 | DISTRIBUTION SPACE, WASTE | | | |
| 5.042 | DISTRIBUTION SPACE, WATER | | | |
| 5.043 | DUST FREE ROOM | | | |
| 5.044 | EASEMENT | | | |
| 5.045 | ELEVATORS | | | |
| 5.046 | ENTRY AREA, PEDESTRIAN | | | |
| 5.047 | EQUIP. AREA E/E | | | |
| 5.048 | EQUIP. AREA HVAC | | | |
| 5.049 | EQUIP. AREA PLUMBING | | | |
| 5.050 | EQUIP. RM. REMOTE | | | |
| 5.051 | EQUIP. ROOM | | | |
| 5.052 | EQUIP. ROOM, ELEVATOR | | | |
| 5.053 | EQUIP. ROOM, TELEPHONE | | | |
| 5.054 | FILM REVIEW ROOM | | | |

Table 2 (cont'd)

| CERCL. HIERARCHICAL STRUCTURE | | LISTED 08-22-74 | PAGE 2 |
|--|--------------------------------------|-----------------|--------|
| LISTING OF SORTED LEVEL V FILE RECORDS | | | |
| CERC NO. | DESCRIPTOR | | |
| 5.055 | FLAG POLE AREA | | |
| 5.056 | FUTURE EXPANSTION | | |
| 5.057 | GREASE RACK | | |
| 5.058 | GREASE RACK AREA | | |
| 5.059 | HALL | | |
| 5.060 | HORIZONTAL SERVICE CAVITY | | |
| 5.061 | INCINERATOR ROOM | | |
| 5.062 | INSPECTION RUNWAY VEHICLE | | |
| 5.063 | KITCHEN | | |
| 5.064 | KITCHEN SELF SERVICE | | |
| 5.065 | KITCHETTE | | |
| 5.066 | LANDING PAD | | |
| 5.067 | LANGUAGE LABORATORY | | |
| 5.068 | LAUNDRY ROOM | | |
| 5.069 | LIBRARY BOOK CIRCULATION | | |
| 5.070 | LIBRARY STACK/READING AREA | | |
| 5.071 | LIBRARY WORK ROOM | | |
| 5.072 | LINEN ROOM | | |
| 5.073 | LIVING/SLEEPING AREA, E1 | | |
| 5.074 | LIVING/SLEEPING AREA, E2-E4 | | |
| 5.075 | LIVING/SLEEPING, E5-E6 | | |
| 5.076 | LIVING/SLEEPING, E7-E9 | | |
| 5.077 | LIVING/SLEEPING, GRADE 02- | | |
| 5.078 | LIVING, GRADE 03+ | | |
| 5.079 | LOADING DOCK | | |
| 5.080 | LOBBY | | |
| 5.081 | LOCKER ROOM | | |
| 5.082 | LOUNGE AREA | | |
| 5.083 | LUNCH AREA | | |
| 5.084 | MAIL ROOM | | |
| 5.085 | MAINTENANCE APRON | | |
| 5.086 | METALLURGY LAB SAMPLE PREP/POLISHING | | |
| 5.087 | METALLURGY LAB, FELTING SHOP | | |
| 5.088 | METALLURGY LAB, MICROSCOPE RM | | |
| 5.089 | MISSION PLANNING | | |
| 5.090 | POW/VENT AREA | | |
| 5.091 | NUCLEAR PHYS., RADIOACTIVE CHEM. LAB | | |
| 5.092 | NUCLEAR PHYS., REACTOR LAB | | |
| 5.093 | OFFICE, BATTALION COMMANDER | | |
| 5.094 | OFFICE, BLDG. ENGINEER | | |
| 5.095 | OFFICE, BRANCH HEAD | | |
| 5.096 | OFFICE, CHIEF OF STAFF | | |
| 5.097 | OFFICE, CONTROL | | |
| 5.098 | OFFICE, INSPECTION | | |
| 5.099 | OFFICE, INSTALLATION COMMANDER | | |
| 5.100 | OFFICE, PROFESSIONAL AND ADMIN. | | |
| 5.101 | OFFICE, REGIMENTAL COMMANDERS | | |
| 5.102 | OFFICE, RESEARCHER | | |
| 5.103 | OFFICE, SLCHEMIST/CLERICAL | | |
| 5.104 | OFFICE, SHIPPING/RECEIVING | | |
| 5.105 | OFFICE, SUPERVISORS | | |
| 5.106 | PARADE FIELD | | |
| 5.107 | PANTRY APRON | | |
| 5.108 | PARKING, AUTOMOBILE | | |

Table 2 (cont'd)

| CERL. MECHANICAL STRUCTURE | | LISTED 08-22-74 | PAGE 3 |
|----------------------------|--------------------------------------|-----------------|--------|
| CERL NO. | DESCRIPTION | | |
| 5.109 | PARKING, BICYCLE | | |
| 5.110 | PARKING, SERVICE/DELIVERY | | |
| 5.111 | PATHS, BICYCLE | | |
| 5.112 | PERSONNEL LIFT | | |
| 5.113 | PHOTO LABORATORY | | |
| 5.114 | PHYS. CHEM., COLD ROOM | | |
| 5.115 | PHYS. CHEM., CONSTANT TEMP. ROOM | | |
| 5.116 | PHYS. CHEM., ELECTRON MICROSCOPE LAB | | |
| 5.117 | PHYS. CHEM., GENERAL LAB | | |
| 5.118 | PHYSICAL TRAINING FIELD | | |
| 5.119 | PHYSICS, GENERAL LAB | | |
| 5.120 | PHYSICS, OPTICAL LAB | | |
| 5.121 | PICNIC AREA | | |
| 5.122 | PROJECTION ROOM | | |
| 5.123 | PROJECTION ROOM, REAR SCREEN | | |
| 5.124 | RECEPTION AREA | | |
| 5.125 | RECREATION ROOM | | |
| 5.126 | REFUSE ROOM | | |
| 5.127 | REPRODUCTION | | |
| 5.128 | ROADWAYS, AUTOMOBILE | | |
| 5.129 | ROADWAYS, EMERGENCY | | |
| 5.130 | ROADWAYS, SERVICE/DELIVERY | | |
| 5.131 | ROADWAYS, TRANSIT | | |
| 5.132 | SHIPPING/RECEIVING ROOM | | |
| 5.133 | SHOP MOTOR REPAIR AND REBUILD | | |
| 5.134 | SHOP, ARMAMENT | | |
| 5.135 | SHOP, CARPENTRY | | |
| 5.136 | SHOP, COMMUNICATIONS | | |
| 5.137 | SHOP, ELECTRIC | | |
| 5.138 | SHOP, ELECTRONIC | | |
| 5.139 | SHOP, GENERAL EQUIPMENT | | |
| 5.140 | SHOP, HYDRAULIC | | |
| 5.141 | SHOP, LARGE VEHICLE | | |
| 5.142 | SHOP, MACHINE | | |
| 5.143 | SHOP, METAL | | |
| 5.144 | SHOP, MODEL | | |
| 5.145 | SHOP, PAINT | | |
| 5.146 | SHOP, PAINT AND DOPE | | |
| 5.147 | SHOP, PLUMBING | | |
| 5.148 | SHOP, SHEET METAL | | |
| 5.149 | SHOP, SMALL VEHICLE | | |
| 5.150 | SHOP, WELD AND RADIATOR | | |
| 5.151 | SHOP, WELDING | | |
| 5.152 | SHOP, AIRCRAFT | | |
| 5.153 | SHOWER ROOM | | |
| 5.154 | SPACE PARTS ROOM | | |
| 5.155 | SPECTROGRAPHIC LAB. | | |
| 5.156 | SPORTS FACILITY | | |
| 5.157 | SPORTS FIELD | | |
| 5.158 | STAIRS | | |
| 5.159 | STORAGE YARD, EQUIPMENT | | |
| 5.160 | STORAGE YARD, MATERIALS | | |
| 5.161 | STORAGE/SOURCE, WATER | | |
| 5.162 | STORAGE, AMMUNITION | | |

Table 2 (cont'd)

| GENERAL HIERARCHICAL STRUCTURE | | LISTED 08-22-74 | PAGE 4 |
|--|------------------------------------|-----------------|--------|
| LISTING OF SORTED LEVEL V FILE RECORDS | | | |
| CERL NO. | DESCRIPTOR | | |
| 5.163 | STORAGE, BLOG | | |
| 5.164 | STORAGE, CHEMICAL | | |
| 5.165 | STORAGE, CLOSET | | |
| 5.166 | STORAGE, EXPLOSIVES | | |
| 5.167 | STORAGE, FUEL | | |
| 5.168 | STORAGE, LUMBER | | |
| 5.169 | STORAGE, PAINT | | |
| 5.170 | STORAGE, PARTS | | |
| 5.171 | STORAGE, SANITARY WASTE | | |
| 5.172 | STORAGE, SPARE PARTS | | |
| 5.173 | STORAGE, TOXICS | | |
| 5.174 | STORAGE, VISUAL/TRAINING AID | | |
| 5.175 | STORAGE, WASTE | | |
| 5.176 | STUDY HALL, INDIVIDUAL | | |
| 5.177 | TAPE RECORDING ROOM | | |
| 5.178 | TAXIWAY | | |
| 5.179 | TESTING AREA, AIR FRAME | | |
| 5.180 | TESTING AREA, ARMAMENT | | |
| 5.181 | TESTING AREA, VEHICLE | | |
| 5.182 | TIRE ROOM | | |
| 5.183 | TOILET, MEN | | |
| 5.184 | TOILET, WOMEN | | |
| 5.185 | TOOL ROOM | | |
| 5.186 | TREATMENT, WASTE | | |
| 5.187 | UTILITY PENTHOUSE | | |
| 5.188 | UTILITY SHAFT | | |
| 5.189 | VAULT | | |
| 5.190 | VAULT, ARMS | | |
| 5.191 | VAULT, ELECTRICAL | | |
| 5.192 | VAULT, LIBRARY CLASSIFIED DOCUMENT | | |
| 5.193 | VAULT, PERSONAL ARMS | | |
| 5.194 | VEHICLE MAINTENANCE AREA | | |
| 5.195 | VERDIE AREA | | |
| 5.196 | VESTIBULE | | |
| 5.197 | VIBRATION FREE ROOM | | |
| 5.198 | VISTA/SETTING | | |
| 5.199 | WALKWAYS, PEDESTRIAN | | |
| 5.200 | WASH RACK | | |
| 5.201 | WASHING APRON | | |

Table 3
Level VI Descriptor File

| CERL HIERARCHICAL STRUCTURE | | | LISTED 08-22-74 | PAGE 1 |
|-----------------------------|------------------------------|------|-----------------|--------|
| CERL NO. | DESCRIPTION | FILE | | |
| 6.001 | 'LAYOUT AREA' | | | |
| 6.002 | ACCESS AREA | | | |
| 6.003 | ACID TANK AREA | | | |
| 6.004 | ADMINISTRATION WORK AREA | | | |
| 6.005 | ADMINISTRATION WORK AREA | | | |
| 6.006 | AUDIO VISUAL AREA | | | |
| 6.007 | AUDIO VISUAL PROJECTION AREA | | | |
| 6.008 | AUDIO/VISUAL AREA | | | |
| 6.009 | BALANCE AREA | | | |
| 6.010 | BANKING, PHYSICAL ACCESS | | | |
| 6.011 | BASEBALL FIELD | | | |
| 6.012 | BASKETBALL COURT | | | |
| 6.013 | BOOK CTR. AREA | | | |
| 6.014 | BREAK AREA | | | |
| 6.015 | BUILDING, SETTING | | | |
| 6.016 | BUS STOP | | | |
| 6.017 | CARTEL, DRY | | | |
| 6.018 | CARTEL, WET | | | |
| 6.019 | CATALOG AREA | | | |
| 6.020 | CHEMISTRY, QUANTITATIVE LAB. | | | |
| 6.021 | CIRC/CONVERSATION/REST | | | |
| 6.022 | CLERICAL/TYPING AREA | | | |
| 6.023 | CONFERENCE AREA | | | |
| 6.024 | CONFERENCE AREA | | | |
| 6.025 | CONTROL AREA | | | |
| 6.026 | CONTROL MONITORING AREA | | | |
| 6.027 | CONTROL STATION | | | |
| 6.028 | COOKING AREA | | | |
| 6.029 | COVERED WALKWAY | | | |
| 6.030 | DECONTAMINATION AREA | | | |
| 6.031 | DISPENSING | | | |
| 6.032 | DISPLAY AREA | | | |
| 6.033 | DISPLAY AREA | | | |
| 6.034 | DISPOSAL AREA | | | |
| 6.035 | DISTRIBUTION AREA, E/E | | | |
| 6.036 | DISTRIBUTION AREA, HVAC | | | |
| 6.037 | DISTRIBUTION AREA, PLUMBING | | | |
| 6.038 | DRY AREA | | | |
| 6.039 | DRYING AREA | | | |
| 6.040 | DRYING AREA | | | |
| 6.041 | DUPLICATION AREA | | | |
| 6.042 | E/E | | | |
| 6.043 | E/E EQUIP. | | | |
| 6.044 | E/E EQUIP. AREA | | | |
| 6.045 | EATING AREA | | | |
| 6.046 | EATING AREA | | | |
| 6.047 | FILE AREA | | | |
| 6.048 | FILE AREA | | | |
| 6.049 | FILM DRYING AREA | | | |
| 6.050 | FILM TOUCH UP AREA | | | |
| 6.051 | FOOD PREP. AREA | | | |
| 6.052 | FOOTBALL FIELD | | | |
| 6.053 | FORMATION AREA | | | |
| 6.054 | FRESH AIR CIRCULATION | | | |

Table 3 (cont'd)

| GENERAL HIERARCHICAL STRUCTURE | | LISTED 08-22-74 | PAGE 2 |
|---|-------------------------|-----------------|--------|
| LISTING OF SORTED LEVEL VI FILE RECORDS | | | |
| CEAL NO. | DESCRIPTOR | | |
| 6.055 | FUME CUPBOARD AREA | | |
| 6.056 | FURNACE AREA | | |
| 6.057 | GAS | | |
| 6.058 | GENERAL WORK AREA | | |
| 6.059 | GENERAL WORK AREA | | |
| 6.060 | GROUP MEETING AREA | | |
| 6.061 | HANDICAPPED AREA | | |
| 6.062 | HOCKEY FIELD | | |
| 6.063 | HVAC | | |
| 6.064 | HVAC EQUIP. | | |
| 6.065 | HVAC EQUIP. AREA | | |
| 6.066 | INSPECTION AREA | | |
| 6.067 | KITCHEN AREA | | |
| 6.068 | KITCHENETTE | | |
| 6.069 | LAND USE DEFINITION | | |
| 6.070 | LAVATORY AREA | | |
| 6.071 | LAVATORY AREA | | |
| 6.072 | LIFT AREA, VEHICLE | | |
| 6.073 | LIVING AREA | | |
| 6.074 | LOBBY, EXTERIOR | | |
| 6.075 | LOCKER AREA | | |
| 6.076 | MACHINE AREA | | |
| 6.077 | MACHINE AREA | | |
| 6.078 | MACHINE AREA | | |
| 6.079 | MACHINE AREA | | |
| 6.080 | MAINT PIT | | |
| 6.081 | METERING AREA | | |
| 6.082 | MICROSCOPE AREA | | |
| 6.083 | POSITION STATION | | |
| 6.084 | NATURAL LIGHT ENTRY | | |
| 6.085 | OIL SEPARATOR AREA | | |
| 6.086 | OUTSIDE DINING AREA | | |
| 6.087 | PAINTING AREA | | |
| 6.088 | PARADE AREA | | |
| 6.089 | PERIODICAL READING AREA | | |
| 6.090 | PETROLEUM | | |
| 6.091 | PHYSICAL TRAINING AREA | | |
| 6.092 | PHYSICAL TRAINING STAND | | |
| 6.093 | PLUMBING | | |
| 6.094 | PLUMBING EQUIP. AREA | | |
| 6.095 | PLUMBING EQUIP. AREA | | |
| 6.096 | POLISHING AREA | | |
| 6.097 | PREPARATION AREA | | |
| 6.098 | PREPARATION AREA | | |
| 6.099 | PRESERVATION AREA | | |
| 6.100 | PRIMARY TREATMENT | | |
| 6.101 | PRINT LAYING AREA | | |
| 6.102 | PRINT WOLTING | | |
| 6.103 | PROJECTILE AREA | | |
| 6.104 | POTTING GREEN | | |
| 6.105 | REAR AREA | | |
| 6.106 | REAR AREA | | |
| 6.107 | REAR AREA | | |
| 6.108 | REACTOR AREA | | |

Table 3 (cont'd)

| C.E.R.C. HIERARCHICAL STRUCTURE | | LISTED 08-22-74 | PAGE 3 |
|---|--------------------------------|-----------------|--------|
| LISTING OF SORTED LEVEL VI FILE RECORDS | | | |
| CERL NO. | DESCRIPTION | | |
| 6.109 | RECEPTIONIST/DESK/INFO AREA | | |
| 6.110 | RECORDING AREA | | |
| 6.111 | REFERENCE AREA | | |
| 6.112 | REST AREA | | |
| 6.113 | REVIEW AREA | | |
| 6.114 | SCREEN, VISUAL | | |
| 6.115 | SCREEN, ACOUSTICAL | | |
| 6.116 | SCREEN, CLIMATIC | | |
| 6.117 | SEATING AREA | | |
| 6.118 | SEATING AREA | | |
| 6.119 | SEATING AREA | | |
| 6.120 | SEATING AREA | | |
| 6.121 | SEATING AREA | | |
| 6.122 | SECONDARY TREATMENT | | |
| 6.123 | SHOW-EN AREA | | |
| 6.124 | SLEEPING AREA | | |
| 6.125 | SOCCEP FIELD | | |
| 6.126 | SPARE PARTS STORAGE | | |
| 6.127 | SPEAKERS STATION | | |
| 6.128 | STAIRS | | |
| 6.129 | STORAGE AREA | | |
| 6.130 | STORAGE AREA | | |
| 6.131 | STORAGE AREA | | |
| 6.132 | STORAGE/CHEM, FILM, PAPER, | | |
| 6.133 | STORAGE, ARMS | | |
| 6.134 | STORAGE, AUDIO | | |
| 6.135 | STORAGE, AUDIO VISUAL | | |
| 6.136 | STORAGE, BOOK | | |
| 6.137 | STORAGE, COAT | | |
| 6.138 | STORAGE, COAT | | |
| 6.139 | STORAGE, COAT | | |
| 6.140 | STORAGE, DOCUMENTS | | |
| 6.141 | STORAGE, ELEC. TEST EQUIP. | | |
| 6.142 | STORAGE, ELECTRONIC TEST EQUIP | | |
| 6.143 | STORAGE, GAS | | |
| 6.144 | STORAGE, GENERAL PURPOSE | | |
| 6.145 | STORAGE, LUMBER | | |
| 6.146 | STORAGE, OPTICS | | |
| 6.147 | STORAGE, PAINT | | |
| 6.148 | STORAGE, PAINT AND EQUIPMENT | | |
| 6.149 | STORAGE, PAINT AND EQUIPMENT | | |
| 6.150 | STORAGE, PAPER | | |
| 6.151 | STORAGE, PAPER | | |
| 6.152 | STORAGE, PARTS | | |
| 6.153 | STORAGE, PETROLEUM | | |
| 6.154 | STORAGE, RADIOACTIVE CHEMICAL | | |
| 6.155 | STORAGE, REAGENT | | |
| 6.156 | STORAGE, SPARE PARTS | | |
| 6.157 | STORAGE, SPARE PARTS | | |
| 6.158 | STORAGE, STOCK | | |
| 6.159 | STORAGE, SUPPLIES | | |
| 6.160 | STORAGE, SUPPLIES | | |
| 6.161 | STORAGE, TEST EQUIPMENT | | |
| 6.162 | STORAGE, TOOL | | |

Table 3 (cont'd)

| CERL HIERARCHICAL STRUCTURE | | LISTED 08-22-74 | PAGE 4 |
|--|------------------------------------|-----------------|--------|
| LISTING OF SORTED LEVEL VI FILE RECORDS | | | |
| CERL NO. | DESCRIPTOR | | |
| 6.163 | STORAGE, TOOL | | |
| 6.164 | STORAGE, TOOL | | |
| 6.165 | STORAGE, VEHICLE | | |
| 6.166 | STORAGE, VISUAL EQUIPMENT | | |
| 6.167 | STORAGE, WELD EQUIPMENT | | |
| 6.168 | STORAGE, BUILDING MAINT EQUIP. | | |
| 6.169 | STORAGE, COAT | | |
| 6.170 | STORAGE, LUBRIC | | |
| 6.171 | STORAGE, MEDICAL | | |
| 6.172 | STORAGE, OIL | | |
| 6.173 | STORAGE, RUBBISH | | |
| 6.174 | STORAGE, SITE MAINT EQUIPMENT | | |
| 6.175 | STORAGE, SPIRE PARTS | | |
| 6.176 | STUDENT SEATING AREA | | |
| 6.177 | STUDENT SEATING, WK. BENCH AREA | | |
| 6.178 | STUDENT SEATING, WRITING/REF. | | |
| 6.179 | STUDENT WORK TABLE AREA | | |
| 6.180 | SAMPLE POOL | | |
| 6.181 | TAXI STAGOS | | |
| 6.182 | TEACHING DEVICE/EQUIPMENT/AIO AREA | | |
| 6.183 | TEACHING STATION | | |
| 6.184 | TENNIS COURT | | |
| 6.185 | TERTIARY TREATMENT | | |
| 6.186 | TOILET AREA | | |
| 6.187 | TOILET AREA | | |
| 6.188 | TOOL STORAGE | | |
| 6.189 | TRAFFIC AREA | | |
| 6.190 | UTENSIL CLEANING AREA | | |
| 6.191 | VEHICLE LIFT AREA | | |
| 6.192 | VEHICLE PAINTING AREA | | |
| 6.193 | VEHICLE WASHING AREA | | |
| 6.194 | VIEWING AREA | | |
| 6.195 | VISUAL RELIEF | | |
| 6.196 | VOLLEY BALL COURT | | |
| 6.197 | WAITING AREA | | |
| 6.198 | WALKWAYS | | |
| 6.199 | WASH AREA | | |
| 6.200 | WASHING AREA | | |
| 6.201 | WORK AREA | | |
| 6.202 | WORK AREA | | |
| 6.203 | WORK AREA | | |
| 6.204 | WORK AREA | | |
| 6.205 | WORK AREA | | |
| 6.206 | WORK AREA | | |
| 6.207 | WORK AREA | | |
| 6.208 | WORK AREA | | |
| END OF CERL NUMBERING SYSTEM ROUTINE FOR DESCRIPTORS | | | |

4 INTEGRATION OF STRUCTURE AND DESCRIPTORS

The following section presents the integration of proposed structure and descriptors. The integration demonstrates several issues of format while helping to present many of the previous comments in a more realistic context.

Expansion

Future expansion will require that new sets of descriptors be added, although many of the proposed descriptors developed here will undoubtedly be utilized. For example, should a Hospital Facility Type be added in the future, many of the descriptors within the Administrative Functional Group will be utilized, but Patient Rooms and certain Laboratories, Operating Rooms, and Treatment Rooms will have to be added.

"Primary" and "Support/Service"

It is proposed that Level V descriptors be categorized as "Primary" functional spaces when their primary use is for occupants involved in activities associated with the designated facility type, i.e., Administrative Office Facilities--spaces used for occupants involved in administrative and office activities. Conversely, it is proposed that Level V descriptors be categorized as "Support/Service" functional spaces when their primary use is for occupants involved in activities providing services or support to the facility or provided for public use, i.e., janitorial spaces, public corridors, and toilets.

The authors believe that this is necessary in order to describe the basic Shop Maintenance functional spaces as the "Primary" spaces which they are, while establishing separate "Support/Service" spaces. The "Primary" versus "Support/Service" distinction is both a useful programming and design separation. Most spaces will not be affected but where there are those that are, it is thought that this distinction will be helpful.

Level IV--Functional Group

Due to the changing nature of the functions and activities incorporated into the various Facility Types, some of the Functional Groups are unique to descriptors on the three levels above, while others are repetitious.

For example, in a bachelor housing facility, there would be no "Research" descriptor, and the descriptor "Landscape" will probably never be included under the Level II descriptor, "Interior." On the other hand, it is expected that the descriptor "Utility Areas" will occur under most or all facility types, under the descriptor "Interior" on Level II and under Support/"Services" on Level III.

The Level IV descriptors herein are extremely sensitive to the previous levels and in particular, to the first level, Facility Type. In the future, when a Facility Type is added, it is likely that new Level IV descriptors for that facility will have to be added.

Level VI--Descriptor Repetition

The Level VI, Activity Space, descriptor has been used to permit a single Level V Functional Space descriptor by accounting for the several variations possible in that space that would otherwise demand a separate Functional Space descriptor. Work with the "Interior" segment of the structure leads to the conclusion that repeating a Level VI Activity Space descriptor category where:

1. That Level VI descriptor has previously been established to contain precise, pertinent information and criteria for use with another Level V descriptor category.

2. That Level VI descriptor category is the only category that pertains to another Level V descriptor category. For example, there are a number of offices, distinguished among other ways, by their Activity Space descriptors:

- | | |
|-----------------------------------|--|
| 1. Office, Battalion Commander | Administration work area Conference area |
| 2. Office, Branch Head | Administration work area |
| 3. Office, Chief of Staff | Administration work area Conference area |
| 4. Office, Installation Commander | Administration work area Conference area |
| 5. Office, Regimental Commanders | Administration work area Conference area |
| 6. Office, Secretarial/Clerical | Clerical/typing area Machine area Storage, supplies Work area |

The most limited of these spaces ("Office, Supervisors" in this case) is solely defined by one Activity Space descriptor, i.e., "Work Area." That descriptor category has therefore been repeated.

Administrative Office Facilities

Figure 2 represents the appropriate levels for Administrative Office Facilities. When an item does not apply, it is shaded in. Note that on Level II, both "Exterior" and "Interior" apply; on Level IV under "Interior Primary Functions," Maintenance and Research do not apply; and on Level IV, "Exterior Primary Functions," Maintenance Research, and Training do not apply.

Table 4 is the complete computer printout of the "Hierarchical Structure" for this facility type.

Bachelor Housing

Figure 3 is a diagram representing the appropriate levels for Bachelor Housing. When an item does not apply, it is shaded in. Note that on Level II, both "Exterior" and "Interior" apply; on Level IV under "Interior Primary Functions," Administration, Assembly, Maintenance, Research, and Training do not apply; and on Level IV, "Exterior Primary Functions," Maintenance, Research, and Training do not apply.

Table 5 is the complete computer printout of the "Hierarchical Structure" for this facility type.

Classroom/Training Facilities

Figure 4 represents the appropriate levels for Classroom/Training Facilities. When an item does not apply, it is shaded in. Note that on Level II, both "Exterior" and "Interior" apply; on Level IV under "Interior Primary Functions," Assembly, Production, Maintenance, and Research do not apply; and on Level IV, "Exterior Primary Functions," Maintenance and Research do not apply.

Table 6 is the complete diagram computer printout of the "Hierarchical Structure" for this facility type.

Research and Development Laboratories

Figure 5 represents the appropriate levels for Research and Development Labs. When an item does not apply, it is shaded in. Note that in Level II, both "Exterior" and "Interior" apply; on Level IV under "Interior Primary Functions," Maintenance and Training do not apply; and on Level IV, "Exterior Primary Functions," Maintenance and Training do not apply.

Table 7 is the complete computer printout of the "Hierarchical Structure" for this facility type.

Shop Maintenance Facilities

Figure 6 represents the appropriate levels for Shop Maintenance Facilities. When an item does not apply, it is shaded in. Note that on Level II, both "Exterior" and "Interior" apply; on Level IV under "Interior Primary Functions," Production, Research, Residence, and Training do not apply; and on Level IV, "Exterior Primary Functions," Research and Training do not apply.

Table 8 is the complete computer printout of the "Hierarchical Structure" for this facility type.

Combination Facilities

The proposed structure presented herein assumes that a programmer who is faced with a combined facility type such as Administrative Classroom Facility will utilize the contents of both facility types to produce a single program.

Combined Spaces

In a similar manner, it is assumed that descriptor categories and their contents, although presented separately from other categories and contents, will combine them where necessary to produce single spaces in response to a project's needs, i.e., create multi-purpose rooms where necessary.

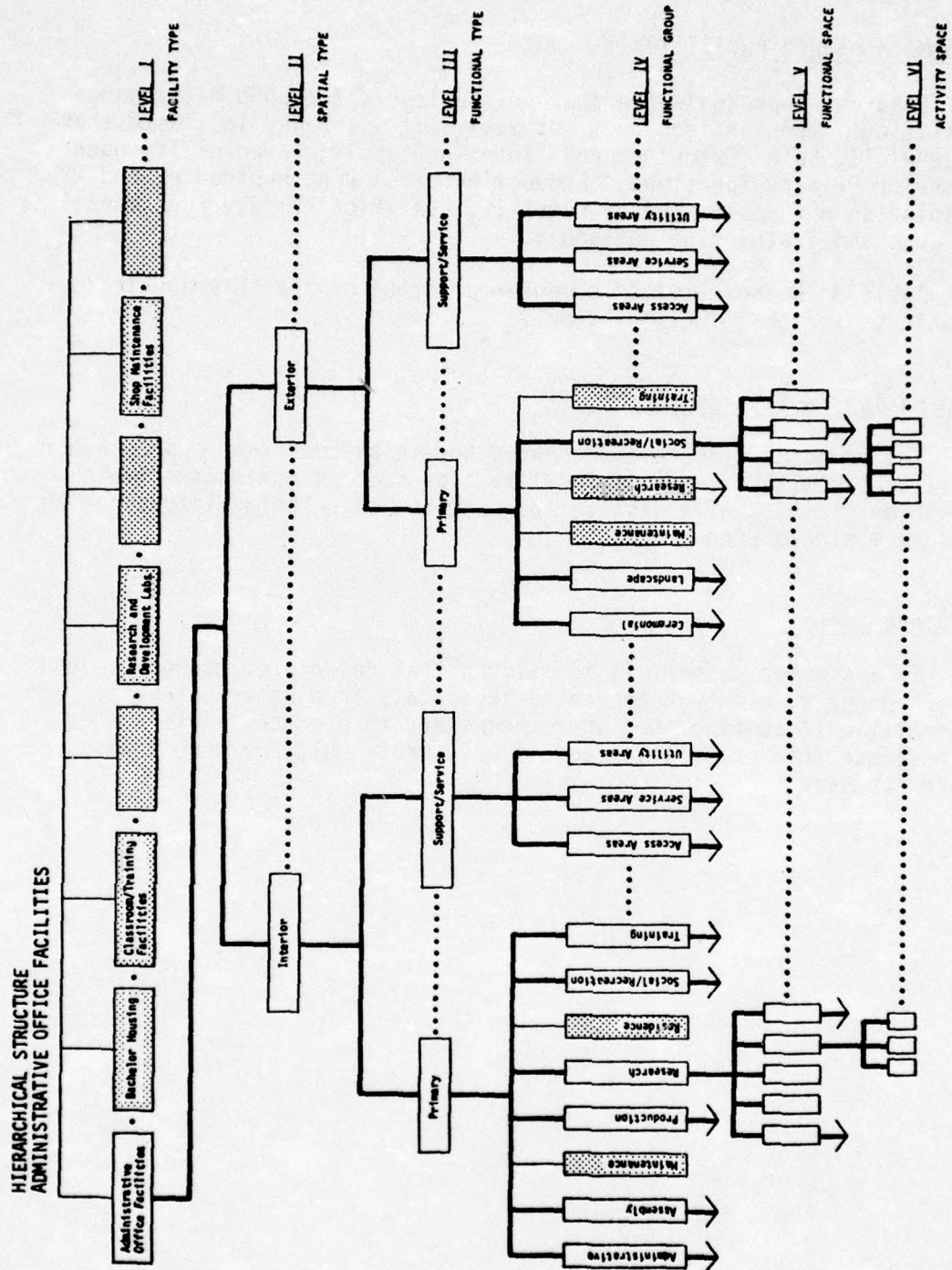


Figure 2. Administrative office facilities hierarchy.

Table 4
Hierarchical Structure for Administrative
Office Facilities

FINAL REPORT OF
A PROPOSED HIERARCHICAL STRUCTURE
OF FUNCTIONAL SPACES FOR BUILDINGS

LISTED 9-23-74

| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE | LEVEL VI ACTIVITY SPACE |
|--------------------------|--------------------------|------------------------------|------------------------------|--|--|
| ADMIN OFFICE FACIL | INTERIOR | PRIMARY | ADMINISTRATIVE | CENTRAL FILE CONFERENCE (PRIVATE) OFFICE, BATTALION COMMANDER OFFICE, BRANCH HEAD OFFICE, CHIEF OF STAFF OFFICE, INSTALLATION COMMANDER OFFICE, REGIMENTAL COMMANDERS OFFICE, SECRETARIAL/CLERICAL OFFICE, SUPERVISORS RECEPTION AREA | ADMINISTRATION WORK AREA CONFERENCE AREA ADMINISTRATION WORK AREA ADMINISTRATION WORK AREA CONFERENCE AREA ADMINISTRATION WORK AREA CONFERENCE AREA ADMINISTRATION WORK AREA CONFERENCE AREA CLERICAL/TYPING AREA MACHINE AREA STORAGE, SUPPLIES WORK AREA WORK AREA DISPLAY AREA RECEPTIONIST/DESK/INFO AREA WAITING AREA |
| | | | ASSEMBLY | VAULT AUDITORIUM | SEATING AREA SPEAKERS STATION STORAGE, COAT STORAGE, GENERAL PURPOSE SEATING AREA SPEAKERS STATION STORAGE, COAT DISPLAY AREA STORAGE, COAT STORAGE, GENERAL PURPOSE WORK AREA |
| | | | | BRIEFING | SEATING AREA SPEAKERS STATION STORAGE, COAT |
| | | | | CONFERENCE | SEATING AREA SPEAKERS STATION STORAGE, COAT STORAGE, GENERAL PURPOSE WORK AREA |

FINAL REPORT OF

A PROPOSED HIERARCHICAL STRUCTURE
OF FUNCTIONAL SPACES FOR BUILDINGS

LISTED 8-23-74

| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE | LEVEL VI ACTIVITY SPACE |
|--------------------------|--------------------------|------------------------------|--------------------------------|-----------------------------|--|
| ADMIN OFFICE FACIL | INTERIOR | PRIMARY | ASSEMBLY | FILM REVIEW ROOM | AUDIO/VISUAL AREA SEATING AREA STORAGE, COAT |
| | | | | MISSION PLANNING | PRESENTATION AREA SEATING AREA STORAGE, COAT STORAGE, DOCUMENTS |
| | | | PRODUCTION | COMPUTER ROOM | MACHINE AREA STORAGE, PAPER |
| | | | DARK ROOM | | |
| | | | PHOTO LABORATORY | | FILM DRYING AREA FILM TOUCH UP AREA LAYOUT AREA PRINT DRYING AREA PRINT MOUNTING STORAGE/CHEM, FILM, PAPER, VIEWING AREA |
| | | | REPRODUCTION | | MACHINE AREA STORAGE, SUPPLIES WORK AREA |
| | | RESEARCH | CLASSIFIED READING ROOM | | CARREL, DRY CARREL, WET CONTROL STATION |
| | | | LIBRARY BOOK CIRCULATION | | BOOK CIR. AREA CATALOG AREA DUPLICATION AREA REFERENCE AREA |
| | | | LIBRARY STACK/READING AREA | | CARREL, DRY CARREL, WET PERIODICAL READING AREA |
| | | SOCIAL/RECREATION | VAULT, LIBRARY CLASSIFIED DOC. | | |
| | | LOUNGE AREA | | | |
| | | LUNCH AREA | | | |
| | | VENDING AREA | | | MACHINE AREA |

Table 4 (cont'd)

| FINAL REPORT OF A PROPOSED HIERARCHICAL STRUCTURE OF FUNCTIONAL SPACES FOR BUILDINGS | | | | | | LISTED 8-23-74 |
|--|--------------------------|---|------------------------------|------------------------------|--|----------------|
| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE | LEVEL VI ACTIVITY SPACE | |
| ADMIN OFFICE FACIL | INTERIOR | PRIMARY SUPPORT/SERVICES ACCESS AREAS | SOCIAL/RECREATION | VENUE AREA | SLATING AREA | |
| | | | | CORRIDOR | | |
| | | | | ELEVATORS | | |
| | | | | LOBBY | | |
| | | | | STAIRS | | |
| | | | | VESTIBULE | | |
| | | | | CLOSET, JANITORS | | |
| | | | | INCINERATOR ROOM | | |
| | | | | LIBRARY WORK ROOM | | |
| | | | | LOCKER ROOM | | |
| | | | | MAIL ROOM | | |
| | | | | PROJECTION ROOM | PROJECTION AREA | |
| | | | | PROJECTION ROOM, REAR SCREEN | PROJECTION AREA STORAGE, VISUAL EQUIPMENT | |
| | | | | REFUSE ROOM | DISPOSAL AREA STORAGE AREA | |
| | | | | SHIPPING/RECEIVING ROOM | ADMINISTRATION WORK AREA WORK AREA | |
| SHOWER ROOM | | | | | | |
| STORAGE, BLDG | | | | | | |
| STORAGE, LUMBER | | | | | | |
| STORAGE, PAINT | | | | | | |
| TOILET, MEN | | LAVATORY AREA TOILET AREA | | | | |
| TOILET, WOMEN | | LAVATORY AREA TOILET AREA MLST AREA | | | | |

Table 4 (cont'd)

| FINAL REPORT OF A PROPOSED HIERARCHICAL STRUCTURE OF FUNCTIONAL SPACES FOR BUILDINGS | | | | | | LISTED 8-23-74 | | | | | | |
|--|--------------------------|------------------------------|------------------------------|-----------------------------|---|----------------|--|--|------------------------|--|--|--|
| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE | LEVEL VI ACTIVITY SPACE | | | | | | | |
| ADMIN OFFICE FACIL | INTERIOR | SUPPORT/SERVICES | SERVICE AREAS | TOILET, WOMEN | TOILET AREA | | | | | | | |
| | | | | VAULT, ARMS | STORAGE, ARMS STORAGE, SPARE PARTS STORAGE, TOOL WORK AREA | | | | | | | |
| | | | | CEILING CAVITY | DISTRIBUTION AREA, L/E DISTRIBUTION AREA, HVAC DISTRIBUTION AREA, PLUMBING | | | | | | | |
| | | | UTILITY AREAS | CLOSET, L/E EQUIP. | | | | | | | | |
| | | | | CLOSET, HVAC EQUIP. | | | | | | | | |
| | | | | CLOSET, PLUMBING EQUIP. | | | | | | | | |
| | | | | CRAWL SPACE/UTILITY TUNNEL | | | | | | | | |
| | | | | EQUIP. ROOM | ACCESS AREA CONTROL AREA DISTRIBUTION AREA, L/E DISTRIBUTION AREA, HVAC DISTRIBUTION AREA, PLUMBING | | | | | | | |
| | | | | EQUIP. ROOM, ELEVATOR | L/E EQUIP. AREA HVAC EQUIP. AREA PLUMBING EQUIP. AREA | | | | | | | |
| | | | | EQUIP. ROOM, TELEPHONE | | | | | | | | |
| | | | | | | | | | OFFICE, BLDG. ENGINEER | CONTROL MONITORING AREA WORK AREA | | |
| | | | | | | | | | UTILITY PENTHOUSE | L/E EQUIP. HVAC EQUIP. PLUMBING EQUIP. | | |
| | | | | | | | | | UTILITY SHAFT | L/E HVAC PLUMBING | | |
| | | | | | | | | | VAULT, ELECTRICAL | | | |
| | | | | | | | | | FLAG POLL AREA | | | |
| EXTERIOR | PRIMARY | CEREMONIAL | | | | | | | | | | |

Table 4 (cont'd)

FINAL REPORT OF
A. PROPOSED HIERARCHICAL STRUCTURE
OF FUNCTIONAL SPACES FOR BUILDINGS

LISTED 8-23-74

| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE | LEVEL VI ACTIVITY SPACE |
|--------------------------|--------------------------|------------------------------|-------------------------------|-----------------------------|--|
| ADMIN OFFICE FACIL | EXTERIOR | PRIMARY | CEREMONIAL | MONUMENT AREA | PARADE AREA VIEW AREA |
| | | | | PARADE FIELD | BARRIER, PHYSICAL ACCESS SCREEN, VISUAL SCREEN, ACOUSTICAL SCREEN, CLIMATIC |
| | | | LANDSCAPE AREAS | BARRIER/SCREEN | FRESH AIR CIRCULATION NATURAL LIGHT ENTRY |
| | | | | BUILDING SEPARATION | BUILDING, SITTING LAND USE DEFINITION VISUAL RELIEF |
| | | | | FUTURE EXPANSION | CIRC/CONVERSATION/REST |
| | | | | VISTA/SETTING | LOBBY, EXTERIOR RAMPS STAIRS |
| | | | | | HANDICAPPED AREA |
| | | | | BREAK AREA | |
| | | | | COURT YARD | |
| | | | | EASEMENT | |
| | | | SOCIAL/RECREATION | ENTRY AREA, PEDESTRIAN | |
| | | | SUPPORT/SERVICES ACCESS AREAS | PARKING, AUTOMOBILE | |
| | | | | PARKING, BICYCLE | |
| | | | | PARKING, SERVICE/DELIVERY | |
| | | | | PATHS, BICYCLE | |
| | | | | ROADWAYS, AUTOMOBILE | |
| | | | | ROADWAYS, EMERGENCY | |
| | | | | ROADWAYS, SERVICE/DELIVERY | |
| | | | | ROADWAYS, TRANSIT | BUS STOP TAXI STANDS TRAFFIC AREA |

Table 4 (cont'd)

| FINAL REPORT OF A PROPOSED HIERARCHICAL STRUCTURE OF FUNCTIONAL SPACES FOR BUILDINGS | | | | | | LISTED 8-23-74 | |
|--|--------------------------|------------------------------|------------------------------|-----------------------------|---|-----------------|--|
| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE | LEVEL VI ACTIVITY SPACE | | |
| ADMIN OFFICE FACIL | EXTERIOR | SUPPORT/SERVICES | ACCESS AREAS | WALKWAYS, PEDESTRIAN | COVERED WALKWAY RAMP STAIRS WALKWAYS | | |
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| | | | SERVICE AREAS | LOADING DOCK | STORAGE BUILDING PAINT EQUIP. STORAGE SITE PAINT EQUIPMENT | | |
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| | | | UTILITY AREAS | DISPOSAL, STORM WATER | STORAGE OIL STORAGE RUBBISH | | |
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| | | | | DIST. SPACE, STORM WATER | STORAGE, SANITARY WASTE | GAS POLYPOLE | PRIMARY TREATMENT SECONDARY TREATMENT TERTIARY TREATMENT |
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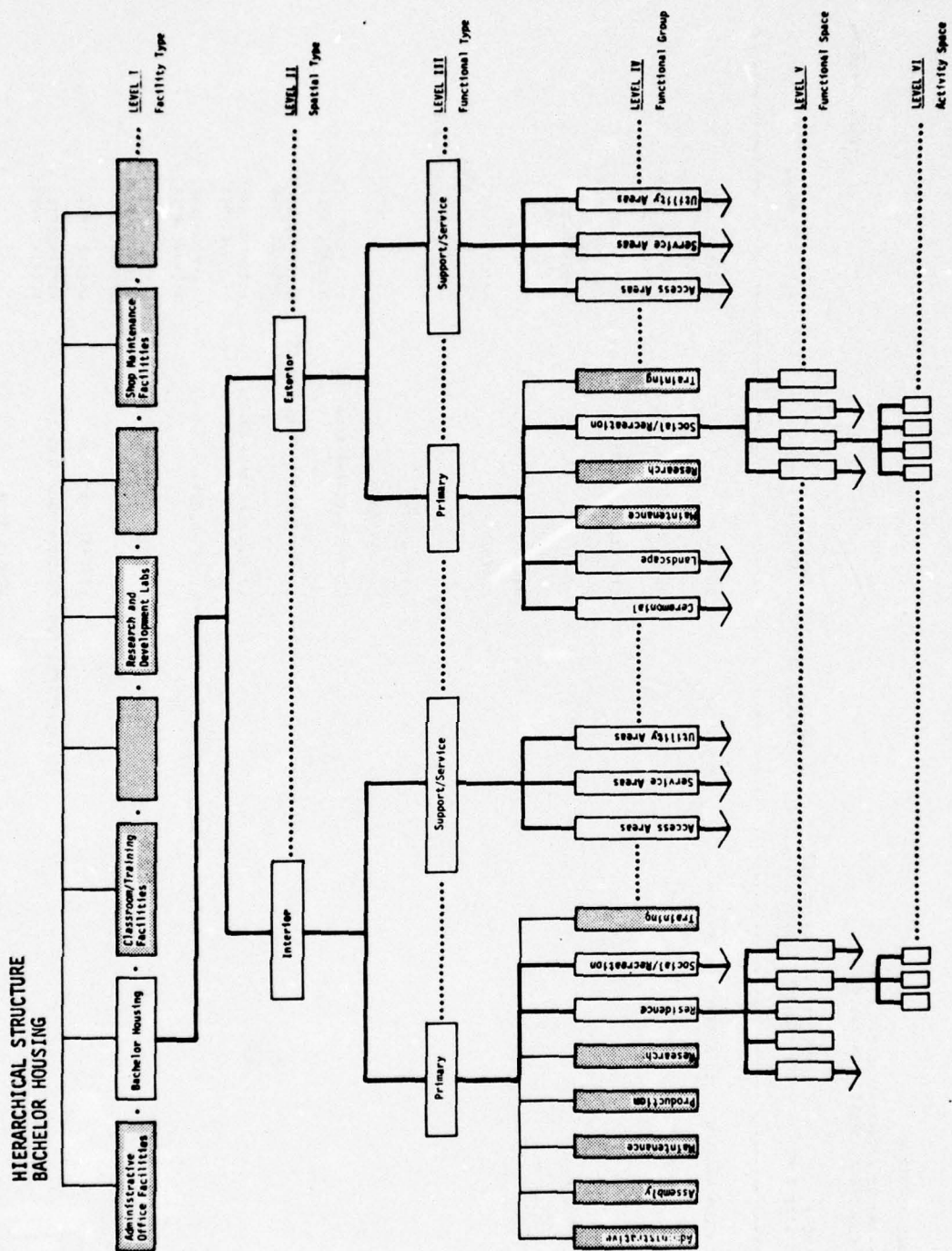


Figure 3. Bachelor housing hierarchy.

Table 5

Hierarchical Structure for Bachelor Housing

LISTED 8-23-74

| FINAL REPORT OF A PROPOSED HIERARCHICAL STRUCTURE OF FUNCTIONAL SPACES FOR BUILDINGS | | | | | |
|--|--------------------------|------------------------------|------------------------------|-----------------------------|--|
| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE | LEVEL VI ACTIVITY SPACE |
| BACHELOR HOUSING | INTERIOR | PRIMARY | RESIDENCE | BATHROOM | LAVATORY AREA TOILET AREA |
| | | | | BEDROOM | SLEEPING AREA STORAGE AREA |
| | | | | CENTRAL BATHROOM | UNWYING AREA LAVATORY AREA LOCKER AREA SHOWER AREA TOILET AREA |
| | | | | MALL | EATING AREA FOOD PREP. AREA STORAGE AREA UTENSIL CLEANING AREA |
| | | | | KITCHEN | |
| | | | | KITCHENETTE | |
| | | | | LAUNDRY ROOM | |
| | | | | LIVING/SLEEPING AREA, E1 | SLEEPING AREA STORAGE AREA |
| | | | | LIVING/SLEEPING AREA, E2-E4 | SLEEPING AREA STORAGE AREA |
| | | | | LIVING/SLEEPING, E5-E6 | SLEEPING AREA STORAGE AREA |
| | | | | LIVING/SLEEPING, E7-E9 | SLEEPING AREA STORAGE AREA |
| | | | | LIVING/SLEEPING, GRADE 02- | LIVING AREA SLEEPING AREA STORAGE AREA |
| | | | | LIVING, GRADE 03+ | LIVING AREA |
| | | | | KITCHEN SELF SERVICE | KITCHENETTE SEATING AREA |
| | | | | LOUNGE AREA | |
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Table 5 (cont'd)

FINAL REPORT OF

A PROPOSED HIERARCHICAL STRUCTURE
OF FUNCTIONAL SPACES FOR BUILDINGS

LISTED 8-23-74

| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE | LEVEL VI ACTIVITY SPACE |
|--------------------------|--------------------------|-------------------------------|------------------------------|-----------------------------|---|
| BACHELOR HOUSING | INTERIOR | PRIMARY | SOCIAL/RECREATION | LUNCH AREA | |
| | | | | RECREATION ROOM | KITCHEN AREA |
| | | | | VENDING AREA | MACHINE AREA SEATING AREA |
| | | SUPPORT/SERVICES ACCESS AREAS | | CORRIDOR | |
| | | | | ELEVATORS | |
| | | | | LOBBY | |
| | | | | STAIRS | |
| | | | | VESTIBULE | |
| | | SERVICE AREAS | | CLOSET, JANITORS | |
| | | | | INCINERATOR ROOM | |
| | | | | LINEN ROOM | |
| | | | | LOCKER ROOM | |
| | | | | OFFICE, CONTROL | |
| | | | | REFUSE ROOM | DISPOSAL AREA STORAGE AREA |
| | | | | SHOWER ROOM | |
| | | | | STORAGE, BLDG | |
| | | | | STORAGE, LUMBER | |
| | | | | STORAGE, PAINT | |
| | | | | TOILET, MEN | LAVATORY AREA TOILET AREA |
| | | | | TOILET, WOMEN | LAVATORY AREA REST AREA TOILET AREA |
| | | | | VAULT, ARMS | STORAGE ARMS |

Table 5 (cont'd)

| FINAL REPORT OF A PROPOSED HIERARCHICAL STRUCTURE OF FUNCTIONAL SPACES FOR BUILDINGS | | | | | | | LISTED 8-23-74 | |
|--|--------------------------|------------------------------|------------------------------|---|--|--|----------------|--|
| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE | LEVEL VI ACTIVITY SPACE | | | |
| BACHELOR HOUSING | INTERIOR | SUPPORT/SERVICES | SERVICE AREAS | VAULT, ARMS | STORAGE, SPARE PARTS STORAGE, TOOL WORK AREA | | | |
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| | | | UTILITY AREAS | VAULT, PERSONAL ARMS CEILING CAVITY CLOSET, L/E EQUIP. CLOSET, HVAC EQUIP. CLOSET, PLUMBING EQUIP. CRAWL SPACE/UTILITY TUNNEL | DISTRIBUTION AREA, L/E DISTRIBUTION AREA, HVAC DISTRIBUTION AREA, PLUMBING | | | |
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| | | | | EQUIP, ROOM | ACCESS AREA CONTROL AREA DISTRIBUTION AREA, L/E DISTRIBUTION AREA, HVAC DISTRIBUTION AREA, PLUMBING L/E EQUIP. AREA HVAC EQUIP. AREA PLUMBING EQUIP. AREA | | | |
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| | | | | EQUIP, ROOM, ELEVATOR EQUIP, ROOM, TELEPHONE OFFICE, BLOG. ENGINEER UTILITY PENTHOUSE UTILITY SHAFT VAULT, ELECTRICAL FLAG POLE AREA POND/NET AREA | CONTROL MONITORING AREA WORK AREA L/E EQUIP. HVAC EQUIP. PLUMBING EQUIP. L/E HVAC PLUMBING | | | |
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Table 5 (cont'd)

LISTED 8-23-74

| FINAL REPORT OF A PROPOSED HIERARCHICAL STRUCTURE OF FUNCTIONAL SPACES FOR BUILDINGS | | | | | |
|--|--------------------------|------------------------------|-------------------------------|-----------------------------|---|
| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE | LEVEL VI ACTIVITY SPACE |
| BACHELOR HOUSING | EXTERIOR | PRIMARY | CEREMONIAL | PARADE FIELD | PARADE AREA VIEW AREA |
| | | | | BARRIER/SCREEN | BARRIER, PHYSICAL ACCESS SCREEN, VISUAL SCREEN, ACOUSTICAL SCREEN, CLIMATIC |
| | | | | BUILDING SEPARATION | FRESH AIR CIRCULATION NATURAL LIGHT ENTRY |
| | | | | FUTURE EXPANSION | BUILDING, SETTING LAND USE DEFINITION VISUAL RELIEF |
| | | | | VISTA/SETTING | CIRC/CONVERSATION/REST |
| | | | | SOCIAL/RECREATION | COCKING AREA EATING AREA |
| | | | | COUNT YARD | BASKETBALL COURT PUTTING GREEN SWIMMING POOL TENNIS COURT VOLLEY BALL COURT |
| | | | | PICNIC AREA | BASEBALL FIELD FOOTBALL FIELD HOCKEY FIELD SUCCER FIELD |
| | | | | SPORTS FACILITY | LOBBY, EXTERIOR RAMPS STAIRS |
| | | | | SPORTS FIELD | |
| | | | SUPPORT/SERVICES ACCESS AREAS | EASEMENT | |
| | | | | ENTRY AREA, PEDESTRIAN | |
| | | | | PARKING, AUTOMOBILE | |
| | | | | PARKING, BICYCLE | |
| | | | | PARKING, SERVICE/DELIVERY | |
| | | | | PATHS, BICYCLE | |

Table 5 (cont'd)

| FINAL REPORT OF A PROPOSED HIERARCHICAL STRUCTURE OF FUNCTIONAL SPACES FOR BUILDINGS | | | | | | LISTED 8-23-74 |
|--|--------------------------|-------------------------------|------------------------------|-----------------------------|--|----------------|
| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE | LEVEL VI ACTIVITY SPACE | |
| BACHELOR HOUSING | EXTERIOR | SUPPORT/SERVICES ACCESS AREAS | | ROADWAYS, AUTOMOBILE | BUS STOP TAXI STANDS TRAFFIC AREA COVERED WALKWAY RAMPS STAIRS WALKWAYS STORAGE, BUILDING MAINT EQUIP. STORAGE, SITE MAINT EQUIPMENT STORAGE, RUBBISH | |
| | | | | ROADWAYS, EMERGENCY | | |
| | | | | ROADWAYS, SERVICE/DELIVERY | | |
| | | | | ROADWAYS, TRANSIT | | |
| | | | | WALKWAYS, PEDESTRIAN | | |
| | | | | STORAGE YARD, EQUIPMENT | | |
| | | | | STORAGE, WASTE | | |
| | | | | DISPOSAL, STORM WATER | | |
| | | | | DISPOSAL, WASTE | | |
| | | | | DIST. SPACE, STORM WATER | | |
| | | | | DISTRIBUTION SPACE, E/E | | |
| | | | | DISTRIBUTION SPACE, GAS | | |
| | | | | DISTRIBUTION SPACE, WASTE | | |
| | | | | DISTRIBUTION SPACE, WATER | | |
| | | | | EQUIP. AREA E/E | | |
| | | UTILITY AREAS | | EQUIP. AREA HVAC | GAS PETROLEUM | |
| | | | | EQUIP. AREA PLUMBING | | |
| | | | | STORAGE/SOURCE, WATER | | |
| | | | | STORAGE, FUEL | | |
| | | | | STORAGE, SANITARY WASTE | | |

Table 5 (cont'd)

| FINAL REPORT OF A PROPOSED HIERARCHICAL STRUCTURE OF FUNCTIONAL SPACES FOR BUILDINGS | | | | | | LISTED 8-23-76 |
|--|--------------------------|------------------------------|------------------------------|------------------------------|--|----------------|
| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE, | LEVEL VI ACTIVITY SPACE | |
| ----- | | | | | | |
| BACHELOR HOUSING | EXTERIOR | SUPPORT/SERVICES | UTILITY AREAS | TREATMENT, WASTE | PRIMARY TREATMENT SECONDARY TREATMENT TERTIARY TREATMENT | |

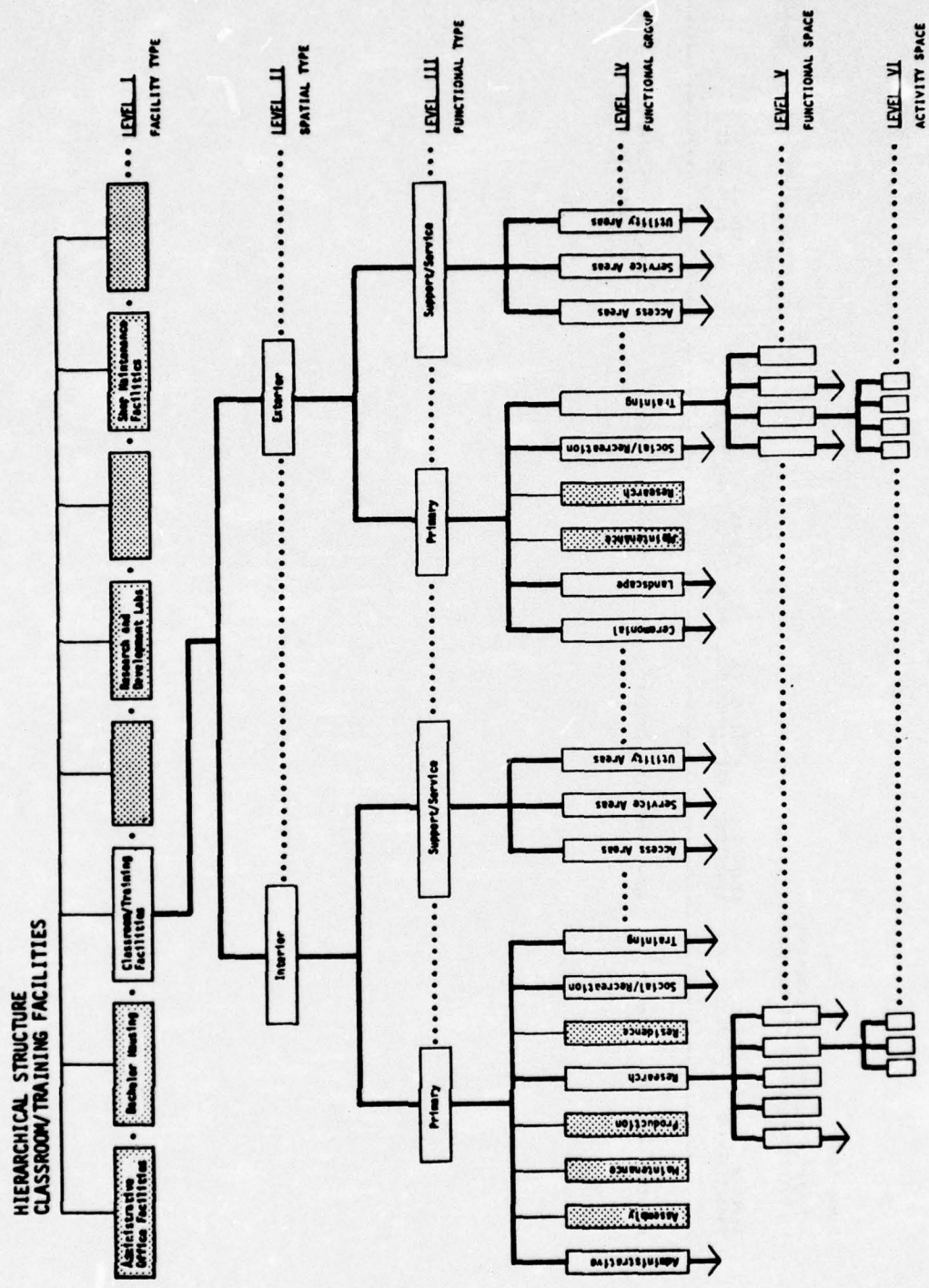


Figure 4. Classroom/training facilities hierarchy.

Table 6
Hierarchical Structure for Classroom/Training Facilities

FINAL REPORT OF
A PROPOSED HIERARCHICAL STRUCTURE
OF FUNCTIONAL SPACES FOR BUILDINGS

LISTED 9-23-74

| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE, | LEVEL VI ACTIVITY SPACE |
|--------------------------|--------------------------|------------------------------|-------------------------------|--|--|
| CLASSRM TRNG FACIL | INTERIOR | PRIMARY | ADMINISTRATIVE | CONFERENCE (PRIVATE) OFFICE, BRANCH HEAD OFFICE, PROFESSIONAL AND ADM. OFFICE, SECRETARIAL/CLERICAL | ADMINISTRATION WORK AREA FILE AREA WORK AREA CLERICAL/TYPING AREA GENERAL WORK AREA MACHINE AREA STORAGE, SUPPLIES WORK AREA |
| | | | RESEARCH | CLASSIFIED READING ROOM LIBRARY BOOK CIRCULATION LIBRARY STACK/READING AREA | CARREL, DRY CARREL, WET CONTROL STATION BOOK CIN. AREA CATALOG AREA DUPLICATION AREA REFERENCE AREA CARREL, DRY CARREL, WET PERIODICAL READING AREA |
| | | | SOCIAL/RECREATION | VAULT, LIBRARY CLASSIFIED DOC. LOUNGE AREA | KITCHENETTE SLATING AREA |
| | | | SUPPORT/SERVICES ACCESS AREAS | LOUNGE AREA CORRIDOR ELEVATORS LOBBY STAIRS VESTIBULE | |
| | | | MAINTENANCE | | |

Table 6 (cont'd)

| FINAL REPORT OF A PROPOSED HIERARCHICAL STRUCTURE OF FUNCTIONAL SPACES FOR BUILDINGS | | | | | | LISTED 8-28-74 |
|--|--------------------------|--------------------------------|------------------------------|-----------------------------|----------------------------|----------------|
| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE | LEVEL VI ACTIVITY SPACE | |
| CLASSRM TRNG FACIL | INTERIOR | SUPPORT/SERVICES SERVICE AREAS | | | | |
| | | CLOSET, JANITORS | | | | |
| | | INCINERATION ROOM | | | | |
| | | LIBRARY WORK ROOM | | | | |
| | | LOCKER ROOM | | | | |
| | PROJECTION AREA | PROJECTION ROOM | | | | |
| | | PROJECTION ROOM, REAR SCREEN | | | | |
| | | REFUSE ROOM | | | | |
| | | SHOWER ROOM | | | | |
| | | STORAGE, BLDG | | | | |
| | UTILITY AREAS | STORAGE, LUMBER | | | | |
| | | STORAGE, PAINT | | | | |
| | | TOILET, MEN | | | | |
| | | TOILET, WOMEN | | | | |
| | | CEILING CAVITY | | | | |
| | PROJECTION AREA | CLOSET, E/E EQUIP. | | | | |
| | | CLOSET, HVAC EQUIP. | | | | |
| | | CLOSET, PLUMBING EQUIP. | | | | |
| | | CRAWL SPACE/UTILITY TUNNEL | | | | |
| | | | | | | |
| | LAVATORY AREA | LAVATORY AREA | | | | |
| | | TOILET AREA | | | | |
| | | LAVATORY AREA | | | | |
| | | REST AREA | | | | |
| | | TOILET AREA | | | | |
| | DISTRIBUTION AREA, E/E | DISTRIBUTION AREA, E/E | | | | |
| | | DISTRIBUTION AREA, HVAC | | | | |
| | | DISTRIBUTION AREA, PLUMBING | | | | |
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| | ACCESS AREA | ACCESS AREA | | | | |
| | | CONTROL AREA | | | | |
| | | DISTRIBUTION AREA, E/E | | | | |
| | | DISTRIBUTION AREA, HVAC | | | | |
| | | DISTRIBUTION AREA, PLUMBING | | | | |

Table 6 (cont'd)

| FINAL REPORT OF A PROPOSED HIERARCHICAL STRUCTURE OF FUNCTIONAL SPACES FOR BUILDINGS | | | | | | | LISTED 8-23-74 | |
|--|--------------------------|------------------------------|------------------------------|-----------------------------|----------------------------|--|----------------|--|
| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE | LEVEL VI ACTIVITY SPACE | | | |
| CLASSRM TRNG FACIL | INTERIOR | SUPPORT/SERVICES | UTILITY AREAS | EQUIP. ROOM | | L/E EQUIP. AREA HVAC EQUIP. AREA PLUMBING EQUIP. AREA | | |
| | | | | EQUIP. ROOM, ELEVATOR | | | | |
| | | | | EQUIP. ROOM, TELEPHONE | | | | |
| | | | | HORIZONTAL SERVICE CAVITY | | ACCESS AREA CONTROL AREA DISTRIBUTION AREA, L/E DISTRIBUTION AREA, HVAC DISTRIBUTION AREA, PLUMBING METERING AREA | | |
| | | | | OFFICE, BLDG. ENGINEER | | CONTROL MONITORING AREA WORK AREA | | |
| | | | | UTILITY PENTHOUSE | | L/E EQUIP. HVAC EQUIP. PLUMBING EQUIP. | | |
| | | | | UTILITY SHAFT | | L/E HVAC PLUMBING | | |
| | | | | VAULT, ELECTRICAL | | | | |
| | | | | FLAG POLE AREA | | | | |
| | | | | MONUMENT AREA | | | | |
| EXTERIOR | PRIMARY | CEREMONIAL | LANDSCAPE AREAS | PARADE FIELD | | PARADE AREA REVIEW AREA | | |
| | | | | BARRIER/SCREEN | | BARRIER, PHYSICAL ACCESS SCREEN, VISUAL SCREEN, ACOUSTICAL SCREEN, CLIMATIC | | |
| | | | | BUILDING SEPARATION | | FRESH AIR CIRCULATION NATURAL LIGHT ENTRY | | |
| | | | | FUTURE EXPANSION | | | | |
| | | | | VISTA/SETTING | | BUILDING, SETTING | | |
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FINAL REPORT OF A PROPOSED HIERARCHICAL STRUCTURE OF FUNCTIONAL SPACES FOR BUILDINGS

LISTEN 0-23-74

| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE, | LEVEL VI ACTIVITY SPACE |
|--------------------------|--------------------------|------------------------------|-------------------------------|------------------------------|---|
| CLASSRM TRNG FACIL | EXTERIOR | PRIMARY | LANDSCAPE AREAS | VISTA/SETTING | LAND USE DEFINITION VISUAL RELIEF |
| | | | SOCIAL/RECREATION | BREAK AREA | CIRC/CONVERSATION/REST |
| | | | COURT YARD | EASEMENT | LOBBY, EXTERIOR RAMPS STAIRS |
| | | | SUPPORT/SERVICES ACCESS AREAS | ENTRY AREA, PEDESTRIAN | HANDICAPPED AREA |
| | | | | PARKING, AUTOMOBILE | |
| | | | | PARKING, BICYCLE | |
| | | | | PARKING, SERVICE/DELIVERY | |
| | | | | PATHS, BICYCLE | |
| | | | | ROADWAYS, AUTOMOBILE | |
| | | | | ROADWAYS, EMERGENCY | |
| | | | | ROADWAYS, SERVICE/DELIVERY | |
| | | | | ROADWAYS, TRANSIT | BUS STOP TAXI STANDS TRAFFIC AREA |
| | | | | WALKWAYS, PEDESTRIAN | COVERED WALKWAY RAMPS STAIRS WALKWAYS |
| | | | MAINTENANCE | | |
| | | | SERVICE AREAS | LOADING DOCK | |
| | | | | STORAGE YARD, EQUIPMENT | STORAGE, BUILDING MAINT EQUIP. STORAGE, SITE MAINT EQUIPMENT |
| | | | | STORAGE YARD, MATERIALS | STORAGE, GAS STORAGE, PLUMBOLUM STORAGE, LUMBER |

Table 6 (cont'd)

FINAL REPORT OF

A PROPOSED HIERARCHICAL STRUCTURE
OF FUNCTIONAL SPACES FOR BUILDINGS

LISTED 8-23-74

| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE, | LEVEL VI ACTIVITY SPACE | | | |
|--------------------------|--------------------------|------------------------------|------------------------------|------------------------------|----------------------------|--|--|--|
| CLASSRM TRNG FACIL | EXTERIOR | SUPPORT/SERVICES | SERVICE AREAS | STORAGE YARD, MATERIALS | STORAGE, MEDICAL | | | |
| | | | | STORAGE, WASTE | STORAGE, OIL | | | |
| | | | | DISPOSAL, STORM WATER | STORAGE, RUBBISH | | | |
| | | | | DISPOSAL, WASTE | | | | |
| | | | | DIST. SPACE, STORM WATER | | | | |
| | | | | DISTRIBUTION SPACE, E/E | | | | |
| | | | | DISTRIBUTION SPACE, GAS | | | | |
| | | | | DISTRIBUTION SPACE, WASTE | | | | |
| | | | | DISTRIBUTION SPACE, WATER | | | | |
| | | | | EQUIP. AREA E/E | | | | |
| | | | UTILITY AREAS | EQUIP. AREA HVAC | | | | |
| | | | | EQUIP. AREA PLUMBING | | | | |
| | | | | STORAGE/SOURCE, WATER | | | | |
| | | | | STORAGE, FUEL | | | | |
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| | | | | STORAGE, SANITARY WASTE | | | | |
| | | | | TREATMENT, WASTE | | | | |
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| GAS | | | | | | | | |
| PETROLEUM | | | | | | | | |
| PRIMARY TREATMENT | | | | | | | | |
| SECONDARY TREATMENT | | | | | | | | |
| TERTIARY TREATMENT | | | | | | | | |

C.E.R.L. REPORT IS COMPLETED.

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HIERARCHICAL STRUCTURE RESEARCH AND DEVELOPMENT LABS

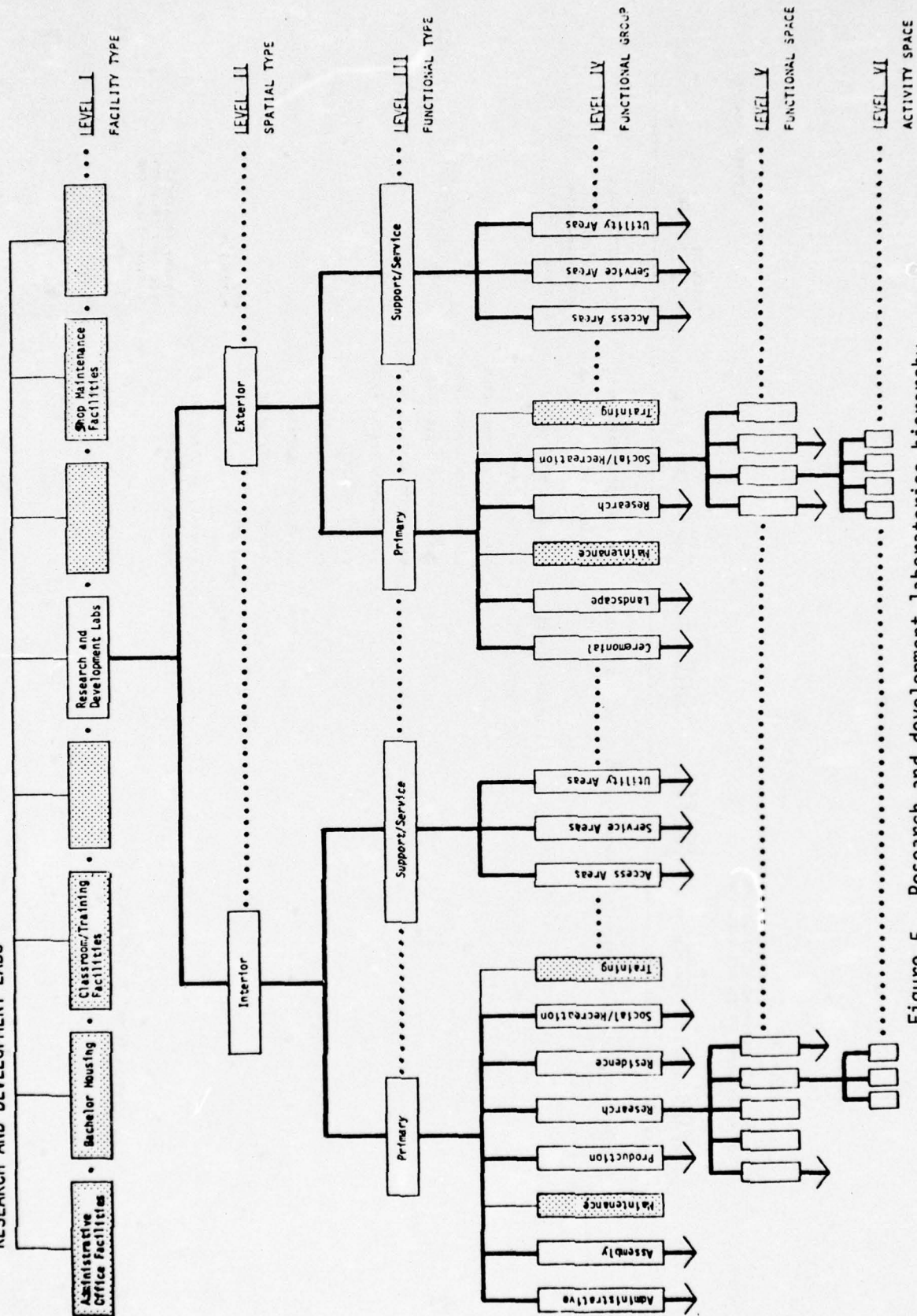


Figure 5. Research and development laboratories hierarchy.

Table 7

Hierarchical Structure for Research and Development Laboratories

FINAL REPORT OF
A PROPOSED HIERARCHICAL STRUCTURE
OF FUNCTIONAL SPACES FOR BUILDINGS

LISTED 8-23-74

| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE | LEVEL VI ACTIVITY SPACE |
|--------------------------|--------------------------|------------------------------|------------------------------|--|--|
| ROST LABORATORY | INTERIOR | PRIMARY | ADMINISTRATIVE | CONFERENCE (PRIVATE) OFFICE, RESEARCHER OFFICE, SECRETARIAL/CLERICAL OFFICE, SHIPPING/RECEIVING RECEPTION AREA | CLERICAL/TYPING AREA MACHINE AREA STORAGE, SUPPLIES ADMINISTRATION WORK AREA WORK AREA DISPLAY AREA RECEPTIONIST/DESK/INFO AREA WAITING AREA SLATING AREA SPEAKERS STATION STORAGE, COAT DISPLAY AREA STORAGE, COAT STORAGE, GENERAL PURPOSE WORK AREA MACHINE AREA STORAGE, PAPER |
| | | | ASSEMBLY | BRIEFING CONFERENCE | |
| | | | PRODUCTION | COMPUTER ROOM DARK ROOM PHOTO LABORATORY | FILM DRYING AREA FILM TOUCH UP AREA LAYOUT AREA PRINT DRYING AREA PRINT YOUTING STORAGE/CHEM, FILM, PAPER, VIEWING AREA MACHINE AREA STORAGE, SUPPLIES WORK AREA |
| | | | RESEARCH | REPRODUCTION APPARATUS ROOM BALANCE ROOM | |
| | | | | | BALANCE AREA PREPARATION AREA |

Table 7 (cont'd)

| FINAL REPORT OF A PROPOSED HIERARCHICAL STRUCTURE OF FUNCTIONAL SPACES FOR BUILDINGS | | | | | | LISTED 8-23-74 | |
|--|--------------------------|------------------------------|------------------------------|--------------------------------|---|----------------|--|
| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE | LEVEL VI ACTIVITY SPACE | | |
| ROST LABORATORY | INTERIOR | PRIMARY | RESEARCH | CENTRIFUGE ROOM | PREPARATION AREA | | |
| | | | | CHEMISTRY, CONSTANT TEMP. ROOM | | | |
| | | | | CHEMISTRY, ELECTRON MICROSCOPE | MICROSCOPE AREA PREPARATION AREA | | |
| | | | | CHEMISTRY, GENERAL LAB | FUME CUPBOARD AREA PREPARATION AREA STORAGE, REAGENT | | |
| | | | | CLASSIFIED READING ROOM | CAPREL, DRY CAPREL, WET CONTROL STATION | | |
| | | | | DARK ROOM, LABORATORY | | | |
| | | | | DUST FREE ROOM | | | |
| | | | | LIBRARY BOOK CIRCULATION | BOOK CIR. AREA CATALOG AREA DUPLICATION AREA REFERENCE AREA | | |
| | | | | LIBRARY STACK/READING AREA | CAPREL, DRY CAPREL, WET PERICULOUS READING AREA | | |
| | | | | METALLURGY LAB, MELTING SHOP | FURNACE AREA PREPARATION AREA | | |
| | | | | METALLURGY LAB, MICROSCOPE RM | MICROSCOPE AREA PREPARATION AREA | | |
| | | | | MTLRGY, LAB PREP/POLISH RM | ACID TANK AREA POLISHING AREA PREPARATION AREA | | |
| | | | | NCLR PHYS., RADIOACT. CHEM LAB | FUME CUPBOARD AREA PREPARATION AREA STORAGE, RADIOACTIVE CHEMICAL | | |
| | | | | NUCLEAR PHYS., REACTOR LAB | DECONTAMINATION AREA PREPARATION AREA REACTOR AREA | | |

Table 7 (cont'd)

FINAL REPORT OF

A PROPOSED HIERARCHICAL STRUCTURE
OF FUNCTIONAL SPACES FOR BUILDINGS

LISTED 0-23-74

| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE | LEVEL VI ACTIVITY SPACE |
|--------------------------|--------------------------|------------------------------|-------------------------------|--------------------------------|---|
| ROBT LABORATORY | INTERIOR | PRIMARY | RESEARCH | PHYS. CHEM., COLD ROOM | PREPARATION AREA |
| | | | | PHYS. CHEM., CONSTANT TEMP. RM | PREPARATION AREA |
| | | | | PHYS. CHEM., ELECT MSCOPE RM | MICROSCOPE AREA PREPARATION AREA |
| | | | | PHYS. CHEM., GENERAL LAB | FUME CUPBOARD AREA STORAGE, REAGENT WORK AREA |
| | | | | PHYSICS, GENERAL LAB | WORK AREA |
| | | | | PHYSICS, OPTICAL LAB | STORAGE, OPTICS WORK AREA |
| | | | | SHOP, MODEL | |
| | | | | SPECTROGRAPHIC LAB. | |
| | | | | STORAGE, CHEMICAL | |
| | | | | VAULT, LIBRARY CLASSIFIED DOC. | |
| | | | SOCIAL/RECREATION | VIBRATION FREE ROOM | |
| | | | | LOUNGE AREA | |
| | | | | LUNCH AREA | |
| | | | | VENDING AREA | |
| | | | | CORRIDOR | |
| | | | | ELEVATORS | |
| | | | | LOBBY | |
| | | | | STAIRS | |
| | | | | VESTIBULE | |
| | | | | CLOSET, JANITORS | |
| | | | SUPPORT/SERVICES ACCESS AREAS | INCINERATION ROOM | |
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Table 7 (cont'd)

LISTED 0-23-74

| FINAL REPORT OF A PROPOSED HIERARCHICAL STRUCTURE OF FUNCTIONAL SPACES FOR BUILDINGS | | | | | |
|--|--------------------------|--------------------------------|------------------------------|-----------------------------|---|
| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE | LEVEL VI ACTIVITY SPACE |
| ROBT LABORATORY | INTERIOR | SUPPORT/SERVICES SERVICE AREAS | | | |
| | | LIBRARY WORK ROOM | | | |
| | | LOCKER ROOM | | | |
| | | PROJECTION ROOM | | | PROJECTION AREA |
| | | PROJECTION ROOM, REAR SCREEN | | | PROJECTION AREA STORAGE, VISUAL EQUIPMENT |
| | | REFUSE ROOM | | | DISPOSAL AREA STORAGE AREA |
| | | SHIPPING/RECEIVING ROOM | | | ADMINISTRATION WORK AREA WORK AREA |
| | | SHOWER ROOM | | | |
| | | STORAGE, BLDG | | | |
| | | STORAGE, LUMBER | | | |
| | | STORAGE, PAINT | | | |
| | | TOILET, MEN | | | LAVATORY AREA TOILET AREA |
| | | TOILET, WOMEN | | | LAVATORY AREA REST AREA TOILET AREA |
| | | CEILING CAVITY | | | DISTRIBUTION AREA, E/E DISTRIBUTION AREA, HVAC DISTRIBUTION AREA, PLUMBING |
| | | UTILITY AREAS | | | |
| | | CLOSET, E/E EQUIP. | | | |
| | | CLOSET, HVAC EQUIP. | | | |
| | | CLOSET, PLUMBING EQUIP. | | | |
| | | CRAWL SPACE/UTILITY TUNNEL | | | |
| | | | | | ACCESS AREA CONTROL AREA DISTRIBUTION AREA, E/E DISTRIBUTION AREA, HVAC DISTRIBUTION AREA, PLUMBING |

Table 7 (cont'd)

LISTED 8-23-74

| FINAL REPORT OF A PROPOSED HIERARCHICAL STRUCTURE OF FUNCTIONAL SPACES FOR BUILDINGS | | | | | | |
|--|--------------------------|------------------------------|------------------------------|-----------------------------|---|--|
| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE | LEVEL VI ACTIVITY SPACE | |
| RC&T LABORATORY | INTERIOR | SUPPORT/SERVICES | UTILITY AREAS | EQUIP, "HCO" | E/E EQUIP. AREA HVAC EQUIP. AREA PLUMBING EQUIP. AREA | |
| | | | | EQUIP. ROOM, ELEVATOR | | |
| | | | | EQUIP. ROOM, TELEPHONE | | |
| | | | | HORIZONTAL SERVICE CAVITY | ACCESS AREA CONTROL AREA DISTRIBUTION AREA, E/E DISTRIBUTION AREA, HVAC DISTRIBUTION AREA, PLUMBING FILTERING AREA | |
| | | | | OFFICE, BLDG. ENGINEER | CONTROL MONITORING AREA WORK AREA | |
| | | | | UTILITY PENTHOUSE | E/E EQUIP. HVAC EQUIP. PLUMBING EQUIP. | |
| | | | | UTILITY SHAFT | E/E HVAC PLUMBING | |
| | | | | VAULT, ELECTRICAL | | |
| | | | | FLAG POLE AREA | | |
| | | | | MONUMENT AREA | | |
| EXTERIOR | PRIMARY | LANDSCAPE AREAS | CEREMONIAL | BARRIERS/SCHEN | BARRIER, PHYSICAL ACCESS SCREEN, VISUAL SCREEN, ACOUSTICAL SCREEN, CLIMATIC | |
| | | | | BUILDING SEPARATION | FRESH AIR CIRCULATION NATURAL LIGHT ENTRY | |
| | | | | FUTURE EXPANSION | | |
| | | | | VISIA/SETTING | BUILDING, SETTING LAND USE DEFINITION VISUAL RELIEF | |

Table 7 (cont'd)

| FINAL REPORT OF A PROPOSED HIERARCHICAL STRUCTURE OF FUNCTIONAL SPACES FOR BUILDINGS | | | | | | LISTED 8-23-74 | |
|--|--------------------------|------------------------------|-------------------------------|-----------------------------|----------------------------|------------------------|---|
| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE | LEVEL VI ACTIVITY SPACE | | |
| ROST LABORATORY | EXTERIOR | PRIMARY | RESEARCH | TESTING AREA, AIM FRAME | | CIRC/CONVERSATION/ALST | |
| | | | | TESTING AREA, ARMAMENT | | | |
| | | | | TESTING AREA, VEHICLE | | | |
| | | | SOCIAL/RECREATION | BREAK AREA | | | |
| | | | | COURT YARD | | | |
| | | | | EASEMENT | | | |
| | | | | ENTRY AREA, PEDESTRIAN | | | LOBBY, EXTERIOR RAMPS STAIRS |
| | | | SUPPORT/SERVICES ACCESS AREAS | PARKING, AUTOMOBILE | | | HANDICAPPED AREA |
| | | | | PARKING, BICYCLE | | | |
| | | | | PARKING, SERVICE/DELIVERY | | | |
| | | | | PATHS, BICYCLE | | | |
| | | | | ROADWAYS, AUTOMOBILE | | | |
| | | | | ROADWAYS, EMERGENCY | | | |
| | | | | ROADWAYS, SERVICE/DELIVERY | | | |
| | | | | ROADWAYS, TRANSIT | | | BUS STOP TAXI STANDS TRAFFIC AREA |
| | | | | | | | COVERED WALKWAY RAMPS STAIRS WALKWAYS |
| | | | | WALKWAYS, PEDESTRIAN | | | |
| | | | SERVICE AREAS | LOADING DOCK | | | |
| | | | | STORAGE YARD, EQUIPMENT | | | STORAGE, BUILDING MAINT EQUIP. STORAGE, SITE MAINT EQUIPMENT |
| | | | | STORAGE YARD, MATERIALS | | | STORAGE, GAS STORAGE, PLT-OLEU |

Table 7 (cont'd)

| FINAL REPORT OF A PROPOSED HIERARCHICAL STRUCTURE OF FUNCTIONAL SPACES FOR BUILDINGS | | | | | | LISTED 8-23-74 |
|--|--------------------------|------------------------------|------------------------------|------------------------------|--|----------------|
| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE, | LEVEL VI ACTIVITY SPACE | |
| RDST LABORATORY | EXTERIOR | SUPPORT/SERVICES | SERVICE AREAS | STORAGE YARD, MATERIALS | STORAGE, LUMBER | |
| | | | | STORAGE, WASTE | STORAGE, OIL | |
| | | | | | STORAGE, RUBBISH | |
| | | | UTILITY AREAS | DISPOSAL, STORM WATER | | |
| | | | | DISPOSAL, WASTE | | |
| | | | | DIST. SPACE, STORM WATER | | |
| | | | | DISTRIBUTION SPACE, E/E | | |
| | | | | DISTRIBUTION SPACE, GAS | | |
| | | | | DISTRIBUTION SPACE, WASTE | | |
| | | | | DISTRIBUTION SPACE, WATER | | |
| | | | | EQUIP. AREA E/E | | |
| | | | | EQUIP. AREA HVAC | | |
| | | | | EQUIP. AREA PLUMBING | | |
| | | | | STORAGE/SOURCE, WATER | | |
| | | | | STORAGE, FUEL | | |
| | | | | STORAGE, SANITARY WASTE | | |
| | | | | TREATMENT, WASTE | | |
| | | | | | GAS PETROLEUM | |
| | | | | | PRIMARY TREATMENT SECONDARY TREATMENT TERTIARY TREATMENT | |

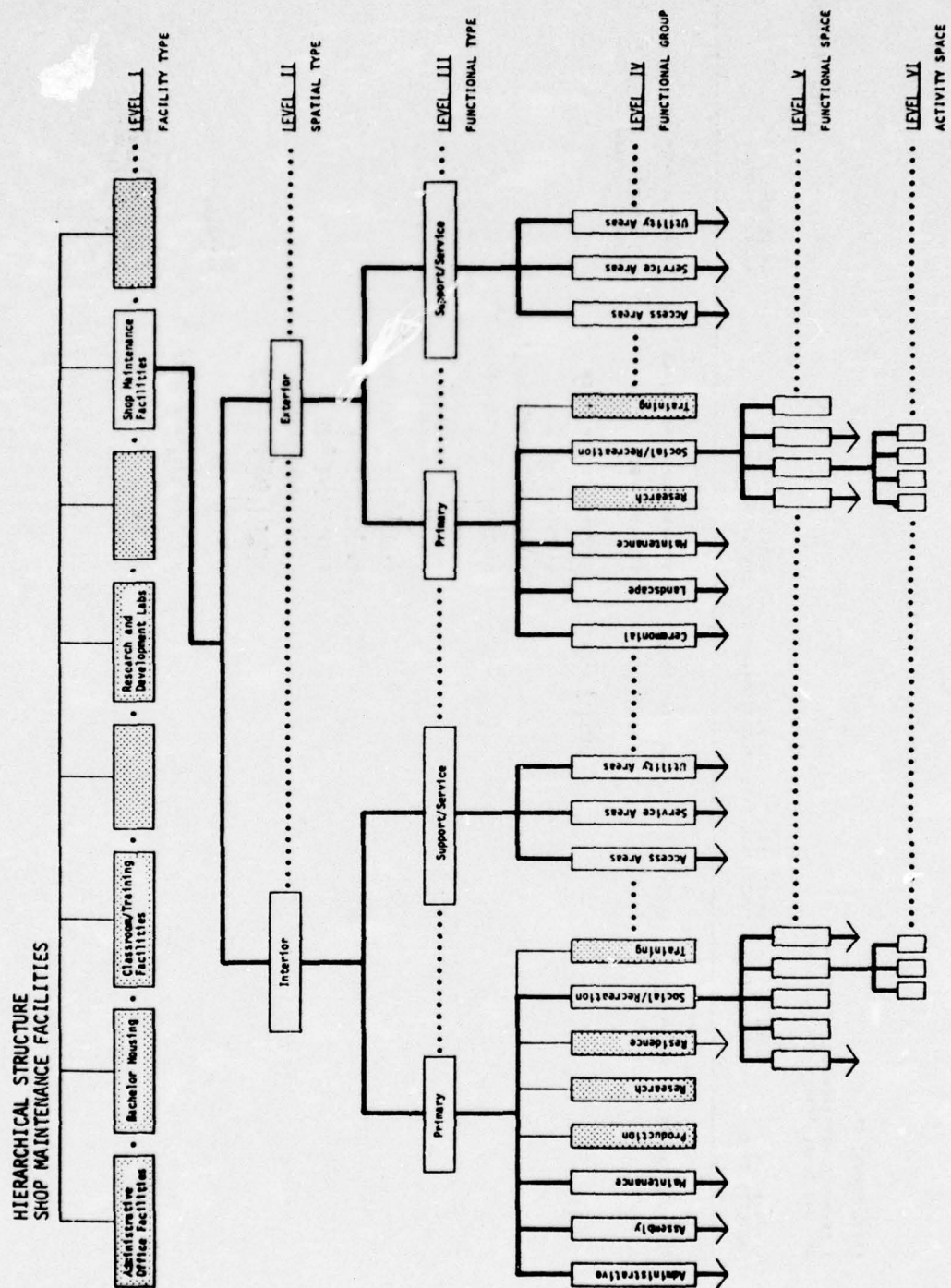


Figure 6. Shop maintenance facilities hierarchy.

Table 8

Hierarchical Structure for Shop Maintenance Facilities

FINAL REPORT OF
A PROPOSED HIERARCHICAL STRUCTURE
OF FUNCTIONAL SPACES FOR BUILDINGS

LISTED 8-23-74

| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE | LEVEL VI ACTIVITY SPACE |
|--------------------------|--------------------------|------------------------------|------------------------------|---|---|
| SHOP MAINT FACIL | INTERIOR | PRIMARY | ADMINISTRATIVE | OFFICE, BRANCH HEAD OFFICE, INSPECTION OFFICE, PROFESSIONAL AND ADM. OFFICE, SECRETARIAL/CLERICAL | ADMINISTRATION WORK AREA ADMINISTRATION WORK AREA WORK AREA FILE AREA WORK AREA CLERICAL/TYPING AREA GENERAL WORK AREA FACILITATION AREA STORAGE, SUPPLIES WORK AREA |
| | | | ASSEMBLY | CONFERENCE | STORAGE, COAT WORK AREA |
| | | | MAINTENANCE | DEFUSING AREA GREASE RACK AREA INSPECTION RUNWAY VEHICLE PERSONNEL LIFT SHOP MOTOR REPAIR AND REBUILD | STORAGE, SPARE PARTS STORAGE, TEST EQUIPMENT WORK AREA |
| | | | | SHOP, ARMAMENT | STORAGE, SPARE PARTS STORAGE, TOOL WORK AREA |
| | | | | SHOP, CARPENTRY | STORAGE, LUMBER STORAGE, TOOL WORK AREA |
| | | | | SHOP, COMMUNICATIONS | STORAGE, ELECTRONIC TEST EQUIP STORAGE, SPARE PARTS STORAGE, TOOL WORK AREA |
| | | | | SHOP, ELECTRIC | STORAGE, SPARE PARTS STORAGE, TEST EQUIPMENT WORK AREA |

Table 8 (cont'd)

| FINAL REPORT OF A PROPOSED HIERARCHICAL STRUCTURE OF FUNCTIONAL SPACES FOR BUILDINGS | | | | | | | LISTED 9-23-74 | |
|--|--------------------------|------------------------------|------------------------------|-----------------------------|----------------------------|---|----------------|--|
| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE | LEVEL VI ACTIVITY SPACE | | | |
| SHOP MAINT FACIL | INTERIOR | PRIMARY | MAINTENANCE | SHOP, ELECTRONIC | SHOP, GENERAL EQUIPMENT | STORAGE, ELEC. TEST EQUIP. STORAGE, TEST EQUIPMENT STORAGE, TOOL WORK AREA STORAGE, SPARE PARTS WORK AREA MAINT PIT STORAGE, SPARE PARTS STORAGE, TOOL WORK AREA MACHINE AREA STORAGE, STOCK STORAGE, TOOL WORK AREA STORAGE, TOOL WORK AREA PAINTING AREA STORAGE, PAINT AND EQUIPMENT PAINTING AREA STORAGE, PAINT AND EQUIPMENT STORAGE, SPARE PARTS STORAGE, TOOL WORK AREA STORAGE, TOOL WORK AREA LIFT AREA, VEHICLE MAINT PIT STORAGE, SPARE PARTS STORAGE, TOOL WORK AREA STORAGE, WELD EQUIPMENT WORK AREA STORAGE, WELD EQUIP. WORK AREA | | |
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| SHOP, WELD AND RADIATOR | | | | SHOP, WELD AND RADIATOR | | | | |
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| SHOP, WELDING | | | | SHOP, WELDING | | | | |
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Table 8 (cont'd)

| FINAL REPORT OF A PROPOSED HIERARCHICAL STRUCTURE OF FUNCTIONAL SPACES FOR BUILDINGS | | | | | | LISTED 8-23-74 |
|--|--------------------------|------------------------------|-------------------------------|-----------------------------|---|----------------|
| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE | LEVEL VI ACTIVITY SPACE | |
| SHOP MAINT FACIL | INTERIOR | PRIMARY | MAINTENANCE | SHOP/AIRCRAFT | STORAGE, TOOL STORAGE, SPARE PARTS WORK AREA | |
| | | | | SPARE PARTS ROOM | ADMINISTRATION WORK AREA, DISPENSING STORAGE, PARTS | |
| | | | | STORAGE, AMMUNITION | | |
| | | | | STORAGE, EXPLOSIVES | | |
| | | | | STORAGE, TOXICS | | |
| | | | | TIRE ROOM | STORAGE, PAINT | |
| | | | | TOOL ROOM | | |
| | | | | WASH RACK | DRY AREA WASH AREA | |
| | | | | | | |
| | | | | | | |
| | | | SOCIAL/RECREATION | LOUNGE AREA | | |
| | | | | LUNCH AREA | | |
| | | | | VENDING AREA | MACHINE AREA SLATING AREA | |
| | | | | CORRIDOR | | |
| | | | | LOBBY | | |
| | | | | STAIRS | | |
| | | | | VESTIBULE | | |
| | | | | CLOSET, JANITORS | | |
| | | | | INCINERATOR ROOM | | |
| | | | | LOCKER ROOM | | |
| | | | SUPPORT/SERVICES ACCESS AREAS | REFUSE ROOM | DISPOSAL AREA STORAGE AREA | |
| | | | | SHIPPING/RECEIVING ROOM | ADMINISTRATION WORK AREA | |
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Table 8 (cont'd)

FINAL REPORT OF

A PROPOSED HIERARCHICAL STRUCTURE
OF FUNCTIONAL SPACES FOR BUILDINGS

LISTED 8-23-74

| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE | LEVEL VI ACTIVITY SPACE |
|--------------------------|--------------------------|------------------------------|------------------------------|-----------------------------|---|
| SHOP MAINT FACIL | INTERIOR | SUPPORT/SERVICES | SERVICE AREAS | SHIPPING/RECEIVING ROOM | WORK AREA |
| | | | | SHOWER ROOM | LAVATORY AREA TOILET AREA |
| | | | | TOILET, MEN | LAVATORY AREA REST AREA TOILET AREA |
| | | | | TOILET, WOMEN | DISTRIBUTION AREA, L/E DISTRIBUTION AREA, HVAC DISTRIBUTION AREA, PLUMBING |
| | | | | CEILING CAVITY | ACCESS AREA CONTROL AREA DISTRIBUTION AREA, L/E DISTRIBUTION AREA, HVAC DISTRIBUTION AREA, PLUMBING |
| | | | | UTILITY AREAS | |
| | | | | CRAWL SPACE/UTILITY TUNNEL | |
| | | | | EQUIP. RM. REMOTE | L/E EQUIP. AREA HVAC EQUIP. AREA PLUMBING EQUIP. AREA |
| | | | | EQUIP. ROOM | L/E HVAC PLUMBING |
| | | | | UTILITY SHAFT | |
| EXTERIOR | PRIMARY | | LANDSCAPE AREAS | VAULT, ELECTRICAL | BARRIER, PHYSICAL ACCESS SCREEN, VISUAL |
| | | | | BARRIER/SCREEN | FRESH AIR CIRCULATION NATURAL LIGHT ENTRY |
| | | | | BUILDING SEPARATION | |
| | | | | FUTURE EXPANSION | BUILDING, SETTING LAND USE DEFINITION VISUAL RELIEF |
| | | | | VISTA/SETTING | WACK AREA |
| | | | MAINTENANCE | GREASE WACK | |

Table 8 (cont'd)

FINAL REPORT OF

A PROPOSED HIERARCHICAL STRUCTURE
OF FUNCTIONAL SPACES FOR BUILDINGS

LISTED 8-23-74

| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE | LEVEL VI ACTIVITY SPACE | | | |
|--|--------------------------|------------------------------|------------------------------|------------------------------|---|--|--|--|
| SHOP PAINT FACIL | EXTERIOR | PRIMARY | MAINTENANCE | GREASE RACK | STORAGE, VEHICLE | | | |
| | | | | LANDING PAD | | | | |
| | | | | MAINTENANCE APRON | STORAGE, VEHICLE WORK AREA | | | |
| | | | | PARKING APRON | | | | |
| | | | | STORAGE, PARTS | | | | |
| | | | | TAXIWAY | | | | |
| | | | | VEHICLE MAINTENANCE AREA | OIL SEPARATION AREA VEHICLE LIFT AREA VEHICLE PAINTING AREA VEHICLE WASHING AREA | | | |
| | | | | | UNWYING AREA STORAGE, VEHICLE WASHING AREA | | | |
| | | | | WASHING APRON | | | | |
| | | | | SOCIAL/RECREATION BREAK AREA | | | | |
| | | | | EASEMENT | | | | |
| | | | | ENTRY AREA, PEDESTRIAN | | | | |
| | | | | PARKING, AUTOMOBILE | | | | |
| | | | | PARKING, BICYCLE | | | | |
| | | | | PARKING, SERVICE/DELIVERY | | | | |
| | | | | ROADWAYS, AUTOMOBILE | | | | |
| | | | | ROADWAYS, SERVICE/DELIVERY | | | | |
| | | | | ROADWAYS, TRANSIT | | | | |
| | | | | WALKWAYS, PEDESTRIAN | | | | |
| | | | | BUS STOP TRAFFIC AREA | | | | |
| COVERED WALKWAY MAPPS STAIRS WALKWAYS | | | | | | | | |

Table 8 (cont'd)

FINAL REPORT OF

A PROPOSED HIERARCHICAL STRUCTURE
OF FUNCTIONAL SPACES FOR BUILDINGS

LISTED 8-23-74

| LEVEL I FACILITY TYPE | LEVEL II SPATIAL TYPE | LEVEL III FUNCTIONAL TYPE | LEVEL IV FUNCTIONAL GROUP | LEVEL V FUNCTIONAL SPACE | LEVEL VI ACTIVITY SPACE | | | |
|--------------------------|--------------------------|------------------------------|------------------------------|-----------------------------|---|--|--|--|
| SHOP MAINT FACIL | EXTERIOR | SUPPORT/SERVICES | SERVICE AREAS | LOADING DOCK | STORAGE, BUILDING MAINT EQUIP. STORAGE, SITE MAINT EQUIPMENT | | | |
| | | | | STORAGE YARD, EQUIPMENT | STORAGE, GAS STORAGE, PETROLEUM STORAGE, LUMBER | | | |
| | | | | STORAGE YARD, MATERIALS | STORAGE, OIL STORAGE, RUBBISH | | | |
| | | | | STORAGE, WASTE | | | | |
| | | | | DISPOSAL, STORM WATER | | | | |
| | | | | DISPOSAL, WASTE | | | | |
| | | | | DIST. SPACE, STORM WATER | | | | |
| | | | | DISTRIBUTION SPACE, E/E | | | | |
| | | | | DISTRIBUTION SPACE, GAS | | | | |
| | | | | DISTRIBUTION SPACE, WASTE | | | | |
| | | | UTILITY AREAS | DISTRIBUTION SPACE, WATER | | | | |
| | | | | EQUIP. AREA, E/E | | | | |
| | | | | EQUIP. AREA, HVAC | | | | |
| | | | | EQUIP. AREA PLUMBING | | | | |
| | | | | STORAGE/SOURCE, WATER | | | | |
| | | | | STORAGE, FUEL | | | | |
| | | | | STORAGE, SANITARY WASTE | | | | |
| | | | | TREATMENT, WASTE | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | GAS PETROLEUM | | | |
| | | | | | PRIMARY TREATMENT SECONDARY TREATMENT TERTIARY TREATMENT | | | |

5 CONCLUSIONS AND RECOMMENDATIONS

This report proposes a hierarchical structure of functional spaces for buildings which can organize facility design criteria for quick and easy reference, retrieval, and maintenance.

Corps personnel need quick and ready access to this data--first as an aid to programming a facility and later for facilitation of their review of design and working drawings. A/E contractors need quick and ready access to all data pertinent to their projects in order to develop a responsive design and to produce complete and coordinated contract documents.

Through the use of this structure, both Corps personnel and their A/E contractors will be able to more readily and completely access the large body of design criteria, so that they, in turn, can insure a timely and appropriate response to the need for Department of Defense facilities.

It is assumed that it will be necessary to re-examine Level I and eventually create at least two levels, i.e., a Level 0 and a Level I. The use of the five Facility Type categories throughout this study and their use herein has proved to be no problem. However, it is almost certain that a change at this level will provide many benefits for project programming and will probably prove helpful for integrating contents and structure.

Presently, a number of the facilities programmed and constructed each year by the Corps are constructed to respond to the requirements of previously constructed projects. They are not unique; they are readily recognized as narrowly defined building types. The first step in gathering information and criteria for either in-house or consultant A/E designers is to study recently designed projects or definitive plans. The final structure and its contents must not be more difficult to use than a reference to existing plans. It therefore seems logical that it must be possible to access a similar set of limited data to make this information system practical.

Conversely, there are inevitably unique projects in which it will be invaluable to a programmer to access the entire content of a Facility Class (Level 0). From this information, he/she may pick and choose from a variety of narrowly defined Facility Types to generate his/her program.

By creating a more narrowly selective Level I Facility Type, it will probably be easier to categorize existing data for this and lower levels. The category of Shop Maintenance Facility is extremely broad, and the contents of Level I will be substantially easier to organize if organized under narrower descriptor categories, such as Ammunition Maintenance Shop, Tank Maintenance Shop, Facility Maintenance Shop, etc.

Figure 7 is a graphic example of this concept presented within the format of this report.

Design Criteria

The impact of design criteria on structure and descriptor categories is impressive. The brief example in the Appendix demonstrates beyond initial expectations that it will be extremely valuable to explore the probable contents in greater depth before proceeding. The limited knowledge of the actual proposed content was adequate for generating the proposals in this report, but additional work will require additional knowledge.

Computerization

Parts of this report have utilized computer capabilities to sort, manipulate, quickly update, and print out work. Duplications have been readily identified and gaps filled in. It is recommended that serious consideration be given to the eventual computerization of the contents of any final structure to permit quick, ready, single-source updating, access, and compilation of its data. Computerization of the eventual contents is probably the only feasible way to identify duplicate and conflicting information and criteria, as well as identify areas which require information and criteria.

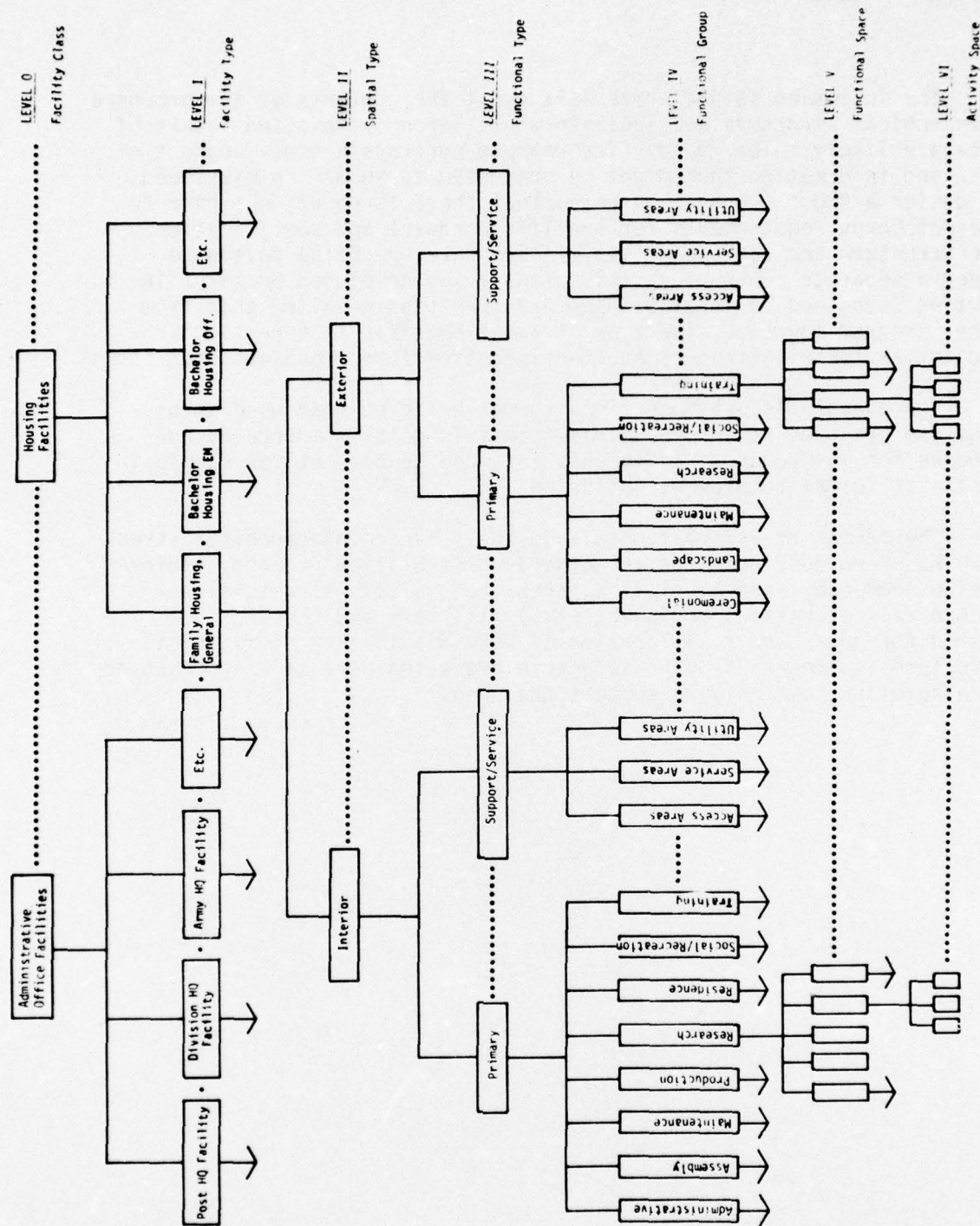


Figure 7. Level 0 example.

APPENDIX: Sample Content

The following sample criteria suggest the contents of the proposed hierarchical structure and indicate where various types and levels of data are likely to be found. The example portrays a cross segment of data and information that might be presented to an A/E commissioned to design a BOQ. (It must be noted that there is no attempt here to present Corps requirements for specific hardware and specifications. The structure and categorization of such data are being developed under a separate contract.) This example was developed by first inserting Corps and DA input on hand and then supplementing that from other program sources. The type of input specific to a particular project or installation was hypothesized from former project data forms.

The example is presented in a format based on that used to present the proposed structure. This format is neither advocated nor opposed for future use. It is only intended to present the sample in a similar format to prevent confusion.

The format of information within the proposed hierarchical structure has been developed for the orderly presentation of data. Information needed by each discipline (architect, civil, structural, mechanical, electrical engineer, etc.) will vary and therefore, a method for quick and easy location of data within this hierarchical structure is important. The structure presented here is *not* presented as a solution, but only to suggest the need.

LEVEL I**FACILITY TYPE****BACHELORS HOUSING****Philosophy:**

BOQ's due to economy shall be of large capacity (100 persons or more). They shall be located on sites which allow for a relaxing view.

Use:

The BOQ's shall be used as personal residences of Enlisted officers in grades 02 and below and grades 03 and above.

Relationships:

The BOQ should be located so as to be easily accessible to all installation facilities. It should have direct access to classroom and administration facilities.

LEVEL II**SPATIAL TYPE****ENCLOSED****Philosophy:**

The rooms of the BOQ should be arranged on a double loaded corridor in clusters of not less than four units.

Size:

The story height shall not exceed 10'-0". The total building height should be designed to practical minimum taking into account the optimum cost trade offs with structural and mechanical systems.

LEVEL III**FUNCTIONAL TYPE****USER****Philosophy:**

The officers using the residence is usually between the age of 22 and 27 years old and views his apartment the same way that a civilian does.

Size:

The user shall consist of officers in Grades 02 and below, and Grades 03 and above.

250 offices shall reside in one complex.

LEVEL IV**FUNCTIONAL GROUP****RESIDENCE****Philosophy:**

The residence should allow for the officers to relax in private whether reading a book, watching television, or listening to his stereo. It also should allow for him to socialize with fellow officers or visiting friends, whether from the facility or not.

Relationship:

The residence should be relatively close to the common lounge space and clothes washing area of the BOQ. Each residence should house no more than two (2) occupants.

Size:

Officers in Grades O2 and below shall have a residence of approximately 330 square feet consisting of a combination living/dining, bath and pullman type kitchen.

Officers in Grades O3 and above shall have a residence of approximately 460 square feet consisting of a living room, bedroom, bathroom and kitchen.

General Design Criteria:

Maximum story height 10'-0"

Interior doors

- a. 2'-8" x 6'-8" minimum
- b. Swing door to have 90° minimum swing.

Windows (including sliding glass doors)

- a. Minimum area 10% of floor area served.
- b. Minimum operable 5% of floor area served.
- c. Maximum area 30% of floor area served.

Structural Criteria:**Design loads****Static or Dead Loads**

All structural elements shall be designed to safely support all dead loads, permanent or temporary, including self weight, partitions (minimum of 10 PSF) roofing, insulation, ceilings, floor covering and mechanical equipment.

LEVEL V**FUNCTIONAL SPACE****LIVING AREA****Philosophy:**

Each living unit shall contain space that is conducive to general living activities, among which are entertaining, reading, writing, listening to music, watching television and relaxing. Unless specifically provided elsewhere in the unit, the above listed activities will be contained in the living unit.

Relationship:

It should be directly accessible to the kitchen, dining area and required exits. It also should be accessible to the sleeping area and bath without passing through any habitable area.

Size:

- a. Minimum width 11 feet 0 inches
- b. Minimum area 160 square feet
- c. Ceiling height minimum 8'-0"
- d. Occupancy two (2) minimum

Mechanical Criteria:

- a. Electric baseboard units shall be provided.

Electrical Criteria:

- a. A switched outlet shall be provided for each living unit.
- b. Receptacles shall be no more than 12 feet apart.
- c. A master TV antenna outlet should be provided.

Lighting Criteria:

If the dining area is included in the living area, provide an overhead switched light.

DINING AREA**Philosophy:**

Each living unit shall contain space for the purpose of dining. This area may be combined with the living room or kitchen, or may possibly be a separate space.

Relationship:

The dining area shall be directly accessible to the kitchen and living area. It should also be accessible to the bathroom without passing through any habitable area.

LEVEL VI**ACTIVITY SPACE****LIVING AREA****CONVERSATION AREA**

A desirable conversation distance is of relatively small size approximately 10 feet in diameter.

STORAGE AREA

Provide 12 lineal feet of shelving for books, records, stereo, TV, etc.

EATING AREA

1 - 42" round table, 4 chairs.
Passage area 24"

STORAGE AREA

Storage Unit 1'-6" x 3'-6"

LEVEL IV

FUNCTIONAL GROUP

Vertical Live Loads

- a. Roof: 20 PSF
- b. Floors: 40 PSF

Horizontal Load (acting inward or outward)

- a. On exterior walls: 25 PSF
- b. On interior walls or partitions: 10 PSF

Seismic Load

- a. Seismic Zone #2

Atmospheric Environment:

Exterior Wall

"U" Factor

- a. (without glazing or doors) 0.15 BTU/hr./sq. ft. maximum.
- b. (doors and glazing) 0.56 BTU/hr./sq. ft. maximum

No settlement or compaction of insulation due to vibration.

Vapor penetration: Provide barrier having permeance of 1 perm minimum. ASTM E-26. Locate to allow passage of interior services within controlled environment.

Moisture Penetration: No moisture drawn to interior surface. ASTM-E331.

Air Infiltration: ASTM-E283

- a. 0.06 CFM/Sq. Ft. of exposed wall
- b. 0.5 CFM/Lin. ft. of door frame
- c. 0.5 CFM/Lin. ft. of operable sash perimeter maximum.

Roof/Ceiling

"U" factor 0.07 BTU/hr./sq. ft. maximum

No entrapment of moisture.

Provide vapor barrier in flat or near flat roof construction.

Provide ventilation of attic spaces. Vent area equal to 1/150 minimum of horizontal projection of roof area.

Floor/Ceiling

"U" factor (floor exposed to exterior): Match requirement for exterior wall, Ref. Sub-System II.

No entrapment of moisture.

Heating, Ventilating and Air Conditioning:

Atmospheric Criteria

Heating

- a. Outside temperature 8 degrees F.
- b. Inside temperature 72 degrees F.

Cooling

- a. Outside temperature 93 degrees F.
- b. Inside temperature 78 degrees F.

LEVEL V

FUNCTIONAL SPACE

Size:

- a. Minimum area
 1. 80 sq. ft. if a separate area
 2. 40 sq. ft. if combined with living area
 3. 40 sq. ft. if combined with the kitchen area
- b. Ceiling height minimum 8'-0"
- c. Occupancy two (2) minimum

Electrical Criteria:

Duplex outlet for eating apparatus.

Lighting Criteria:

Provide one overhead switched light for dining table.

KITCHEN/KITCHENETTE

Philosophy:

The basic activities in the kitchen consist of food preparation, serving and cleanup after the meal. The kitchen area shall permit the efficient operation in the performance of these functions. In addition space shall be provided for staples, dinnerware and utensils.

Relationship:

The kitchen area shall be directly accessible to the dining area, living area and required exit. It also shall be accessible to the bathroom without passing through any habitable room.

Size:

- a. Minimum area 120 sq. ft.
- b. Ceiling height minimum 7'-0"
- c. Occupancy two (2) minimum

General Criteria:

Ceiling height minimum 7'-0".

Mechanical Criteria:

There should be intermittent mechanical exhaust for range hoods.

Plumbing Criteria:

If gas cooking is utilized, a gas service should be provided.

Electrical Criteria:

Two appliance circuits should be provided for each kitchen unit.

Outlets will be provided for cooking equipment and shall be individually circuited.

Lighting Criteria:

Fluorescent luminaires should be utilized for a maintained level of 60 foot candles.

Warm white lamps shall be installed in the fixtures.

LEVEL VI

ACTIVITY SPACE

Food Preparation Area:

Base/Wall Cabinets: 25 Cu. Ft.

Burner Unit: 30" unit with mechanical exhaust.

Oven Unit: 2.7 Cu. Ft. minimum dimension 15".

Refrigeration: W/freezer capacity 8 Cu. Ft.

Sink: Minimum capacity 96 Cu. Ft. Depth 6'-8". Minimum 2-1/2 Lin. Ft. of counter space. Acid resistant porcelain or 18 gauge #304 stainless steel.

Shelving: 15 lin. ft.

Eating Area:

Table w/Chairs: Minimum table dimension 4'-0".

LEVEL IV**FUNCTIONAL GROUP**

- Relative Humidity
 a. Outside W.B. temperature 78
 b. Inside 50% M.C.
- Outside Air: 75 CFM per sq. ft. minimum.
- Air Changes
 a. 7.5 per hour minimum.
 b. 15 per hour maximum.
- Air Movement 50 FPM
- Air filter efficiency: 10% - 15%.
- Design population per BOQ Unit: 2
- Mechanical Services
- Exhaust
 a. Individual thermostatic control for each BOQ Unit.
- Acoustic Criteria:
 a. Ambient Noise Level: NC 25-36
 b. Provide speech privacy between BOQ units.

Electrical/Electronic**Power**

Individual load centers will be installed for each unit.

Receptacles will be circuited together.

Lighting will be circuited together.

All wiring in accordance with minimum requirements of the NEC.

Lighting**General**

All other lighting will be incandescent with special emphasis on make up and reading areas.

Ample wall toggle switches will be installed for proper control of lighting.

Television

- a. One television reception outlet will be installed for each unit.

Telephone

- a. One telephone outlet will be installed for each unit.

Fire Detection System**Acoustic Environment:****Exterior Wall**

Wall (without glazing or doors)
 Sound Transmission Class (STC) 42. ASTM-E90.

Wall (with glazing excluding doors)
 Sound Transmission Class (STC) 27. ASTM-E90.

LEVEL V**FUNCTIONAL SPACE****BEDROOM AREA(SLEEPING AREA)****Philosophy:**

Each living unit shall have a space (open or enclosed) allocated to sleeping and related activities as dressing, personal care, reading and studying. Sufficient space shall be provided for clothes storage.

Relationship:

It shall have direct access to the bathroom area, without passing through any habitable room.

Size:

- a. Minimum width 8'-6".
 b. Minimum area 120 sq. ft. (if enclosed)
 c. Minimum ceiling height 8'

Functional Criteria:

The location of doors, windows and closet shall be planned to facilitate placement of the bed and other furniture.

Placements of the closet near the door in the bedroom minimizes the use of wall space.

Mechanical Criteria:

- a. Provide electric base board heat. 8 lineal feet, a 400 watts/foot.

Electrical Criteria:

- a. Provide one switched outlet.
 b. Provide duplex outlets 12 feet minimum apart.

Lighting Criteria:

- a. Provide a light with pull chain in closet.

Sonic Criteria:

- a. Auditory privacy is required for all bedrooms minimum STC rating of 45.

BATHROOM**Philosophy:**

Bathrooms shall be adequate for a water closet, lavatory and tub or shower. Arrangement for fixtures shall provide for the comfortable use of each fixture and permit a minimum 90° door swing.

LEVEL VI**ACTIVITY SPACE****Sleeping Area:**

3'-0" x 7'-0" minimum sleeping area/man lounge chair.

Storage Closet:

5'-0" 11n. ft. (rod) hanging space.

5'-0" 11n. ft. (shelf) space.

Fixed or movable.

Fixture Area - Provide the following:

Water Closet
 Lavatory
 Bath tub and/or shower
 Towel rod
 Paper Dispenser
 Medicine Cabinet
 Towel Storage

LEVEL IV**FUNCTIONAL GROUP****Roof Ceiling**

Sound Transmission Class (STC)
Meet requirement for exterior wall. Ref. Sub-System II.

Impact Sound Pressure Level: Meet recommendation curve of F.H.A. Guide No. 750.

Interior Wall

Sound transmission Class (STC) 42 minimum (without doors) ASTM-E90.

Sound Transmission Class (STC) 24. Minimum for doors.

Luminous Environment:**Exterior Wall****Illuminated Environment**

- a. Vision through glazing to be undistorted.
- b. Glass shall pass 56% of visible light, minimum.

Roof Ceiling**Illuminated Environment**

- a. Ceiling reflection 70% minimum.

Floor Ceiling**Illuminated Environment**

- a. Ceiling Reflectance: Ref. Roof/Ceiling Sub-System II.
- b. Floor Reflectance: 35% minimum.

Interior Wall**Illuminated Environment**

- a. Glass Rating: Maximum 20. Gardner 60° Glossmeter.

Safety and Convenience:**Exterior Wall****Fire Safety**

Fire Containment: ASTM-E119

- a. Load Bearing: Non-combustible
- b. Non-Load Bearing: Non-combustible

Flame Spread: ASTM-E84

- a. Exterior Surface: 200 Maximum.
- b. Interior Surface: Meet requirements for interior partition.
- c. Insulation: 25 maximum.

Smoke Generation: ASTM STP 442

- a. Exterior Surface: 450 maximum optical density.
- b. Interior Surface: Meet requirements for interior partitions.
- c. Insulation: 50 maximum optical density.

LEVEL V**FUNCTIONAL SPACE**

If residence space has two occupants, the lavatory shall be in a separate space allowing for the private use of the water closet and tub or shower.

Relationship:

The bathroom shall be directly accessible to the bedroom and/or living/sleeping area without passing through any habitable area.

Size:

- a. Minimum area 35 square feet.
- b. Minimum ceiling height 7 feet.
- c. Occupancy two (2) minimum.

Mechanical Criteria:

- a. There shall be intermittent mechanical exhaust 200 CFM.

Electrical Criteria:

- a. Provide a duplex outlet above sink counter.

Lighting Criteria:

- a. Provide switched overhead light.
- b. Provide switched overhead infra-red drying lamp.

Plumbing Criteria:

- a. Provide mixing valve for shower 140° F. maximum.

HALL/ENTRY AREA**Philosophy:**

The hallway and/or entry area shall be a transitioned space between habitable rooms and shall allow for the easy access between these spaces.

The entry area shall be directly accessible the primary required exit and the kitchen and living area.

The hall shall allow access from the bedroom/bath area to the living area and exitway.

LEVEL VI**ACTIVITY SPACE**

LEVEL IV**FUNCTIONAL GROUP**

Potential Heat: 8000 VTU for any square foot of wall section. ASTM proceedings 61.

Transmission of fire and smoke from one floor to another to be prevented.

Roof/Ceiling**Fire Safety**

Fire Containment: Non-combustible. ASTM-E119.

Flame Spread:

- a. Roofing: Class C or better. ASTM-E108.
- b. Ceiling: 75 maximum. ASTM-E84.
- c. Roof used as walking surface: 75 maximum. ASTM-E84.
- d. Insulation: 25 maximum. ASTM-E84.

Smoke Generation: ASTM STP 422.

- a. Ceiling: Maximum optical density 150.
- b. Insulation: Maximum optical density 50.

Potential Heat: 5,000 BTU maximum for any square foot of roof ceiling section. ASTM Proceedings 61.

Floor/Ceiling**Fire Safety**

Fire Containment: Non-combustible ASTM-E119.

Flame Spread: ASTM-E84.

- a. Floor Covering: 200 Maximum.
- b. Ceilings: Match requirement for roof/ceiling Ref. Sub-System III.
- c. Insulation: Match requirement for roof/ceiling. Ref. Sub-System III.

Smoke Generation: ASTM STP422

- a. Floor Covering: Maximum optical density 450.
- b. Ceiling: Match requirement for roof/ceiling. Ref. Sub-System III.
- c. Insulation: Match requirement for roof/ceiling. Ref. Sub-System III.

Potential Heat: 5,000 BTU maximum for any square foot of floor/ceiling section. ASTM Proceedings 61.

Interior Wall**Fire Safety**

Fire Containment. ASTM E-119.

- a. Load Bearings: Non-combustible.

LEVEL V**FUNCTIONAL SPACE****Size:**

- a. Minimum width 3 feet.
- b. Minimum ceiling height 7 feet.

Electrical Criteria:

- a. Provide duplex outlet for cleaning.

Lighting Criteria:

- a. Provide switched overhead lighting fixture if size of space requires one.

LEVEL VI**ACTIVITY SPACE**

CERL DISTRIBUTION

Chief of Engineers
ATTN: DAEN-ASI-L (2)
ATTN: DAEN-FEE-A
ATTN: DAEN-FEM
ATTN: DAEN-FEP
ATTN: DAEN-FESA
ATTN: DAEN-FEZ-A
ATTN: DAEN-MCZ-S
ATTN: DAEN-RDL
ATTN: DAEN-MCE-A
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